4

EXPERIMENTS AND OBSERVATIONS
ON A
NEW SPECIES OF BARK,
SHEWING ITS GREAT EFFICACY IN
VERY SMALL DOSES:
ALSO A
COMPARATIVE VIEW
OF THE POWERS OF THE
RED AND QUILLED BARK;
BEING AN ATTEMPT TOWARDS A
GENERAL ANALYSIS
AND
COMPENDIOUS HISTORY
OF THE VALUABLE
GENUS OF CINCHONA,
OR THE
PERUVIAN BARK.

By RICHARD KENTISH, M.D.

EMBER OF THE ROYAL MEDICAL SOCIETY
AT EDINBURGH,
ORRESPONDENT MEMBER OF THE SOCIETY
OF SCOTTISH ANTIQUARIES, &c. &c.

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micus Plato, amicus Socrates, ſed magis amica veritas.

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ERRATA.

Page 16,	line 15,	*dele* with fixed alkalies.
36,	6,	*after* circumſt. *read* ſame.
44,	24,	*read* Luciæ.
50,	3,	*for* that I forgot, *read* as to make forget.
37,	4,	in the note, *for* this mixture, *read* th latter.
46,	11,	*read* ſhould the period of its fame eve arrive.
64,	22,	to two—the liquor then ſtrained.

TO

Dr. JOSEPH BLACK,

PROFESSOR OF CHEMISTRY IN THE
UNIVERSITY OF EDINBURGH.

SIR,

WHATEVER may be the motives of the preſent dedication, the greatneſs of your character will acquit me of the crime of flattery.—He who as not had the advantage of your nſtruction, has loſt an opportunity of mprovement which in vain is ſought rom others.—He who has profited by t will feel a conſcious pleaſure; and e who poſſeſſes your eſteem and riendſhip, enjoys a happineſs, which to preſerve, ſhall be the pride and conſtant endeavour of,

SIR,

With the moſt unfeigned reſpect and gratitud
for all public and private favors,

Your moſt obliged,

obedient, and

very humble ſervant,

Huntingdon,
Sept. 8, 1784.

RICHARD KENTISH

PREFACE.

THE Author cannot ſend this publication into the world without apology. The ſubject is important, and deſerves attention from the friends of ſcience. A new remedy cannot be introduced into general practice by the labours of an individual, the concurrence of practitioners is neceſſary; and the united efforts of phyſicians are required, to eſtabiiſh the reputation of a new medicine. The author has here endeavoured to diſcharge the duties of his profeſſion, and of ſociety. He has attempted to improve the ſcience of phyſic, by the addition of a powerful remedy. He has attempted to illuſtrate the nature of a vegetable, which had been miſrepreſented; and to aſcertain the action of a medicine,

cine, which falſe theory had obſcured. His performance, not his endeavour, needs apology; and he truſts the candour of judicious criticiſm will overlook the execution in the merit of attempt.

The preſent ſituation of the author is a great inducement to the publication of his obſervations. The county where he now reſides, is peculiarly infeſted with intermittents, remittents, and other diſeaſes in which the bark has been eſteemed efficacious; and from the accounts of the medical practitioners, no part of his Majeſty's ſubjects annually conſume more bark than the inhabitants of *Huntingdonſhire*. This conſideration has induced the author to pay particular attention to the diſeaſes of a country, where he means to practiſe ἐπιβλέπειν ὧν δεῖ καὶ χῶρην, καὶ ὥρην, καὶ ἥλικιήν καὶ νουσοῦς ἐν ησι δεῖ, ἢ οὖ*.

The great advantages which will reſult from the general introduction of the Cinchona Sanctæ Luciæ into general practice, are very manifeſt. Its importation into this kingdom will be readily obtained, its price will be trifling, and the ſmallneſs of its doſe will be its principal recommendation. Few ſtomachs will revolt at the ſight of gr. v. or gr. x. of a powder; but Engliſh ſtomachs are in general too delicate to bear whole drams thrown down at once, which has been the caſe with the quilled and red ſpecies of cinchona.

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* ΙΠΠΟΚΡ. ΑΦ. β.

To conſume more time in preface would be unpardonable. The author therefore ſubmits to the examination of *candid criticiſm* the following thoughts, which, whatever be their fate before the public tribunal, he truſts that it will not leſſen that eſteem, of which he is proud to boaſt from a ſcientific few. "It is the duty of every man, to endeavour that ſomething may be added by his induſtry to the hereditary aggregate of knowledge and happineſs. To add much can indeed be the lot of few; but to add ſomething, however little, every one may

“ hope; and of every honeſt endeavour, it is certain, that, however
“ unſucceſsful, it will be at laſt rewarded.” Rambler, No. 129.

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EXPERIMENTS AND OBSERVATIONS

ON THE

GENUS OF CINCHONA,

OR THE

PERUVIAN BARK.

SECTION I.

ON THE CINCHONA OFFICINALIS, OR QUILLED-BARK.

CHAP. I.

Introduction—Vegetable Arrangement—and General Hiſtory.

EVERY age of Medicine has had its favourite remedy, and every ſchool of Phyſic has added ſomething to the increaſe of the *Materia Medica*; the articles of which, like the inſtruments of mechanics, have been multiplied and diverſified, whilſt the principles on which they acted were altogether unknown, or miſunderſtood. Remedies have been handed down from the days of Hippocrates with unremitting care; and as if the ſtudy of phyſic conſiſted in "culling ſimples," volumes have been written on articles which time has made obſolete, and reaſon laid aſide. The botaniſts boaſted ſimple ſpecifics; the chemiſts their compound panaceas. Thus has the ſcience of medicine been ſtyled an art, and the art of healing ſuppoſed to conſiſt in the knowledge of drugs, or the poſſeſſion of ſecrets. Philoſophy has alternately lent her aſſiſtance to the introduction and expulſion of ſuch opinions. Experiments have been cultivated, and experience has confirmed their utility; but miſtaken notions of the animal œconomy have placed too great confidence in theſe reſearches, and even chemical inveſtigation has been productive of falſe theory and futile practice.

Shall we not then preſume to enquire into the nature, principles, or *modus operandi* of medicines? Is every ſearch after cauſes vain? Is human knowledge ſo confined? Is the *capacity* for ſcience ſo ſmall, that we muſt

reſ

reſt ſatisfied with ignorance, and ſhut the avenues of wiſdom? Heaven forbid! Though ultimate cauſes may for ever eſcape human eyes, yet enquiry is the privilege of reaſon; and the examination of effects, as cauſes of other effects, will tend to improve the heart, and enlighten the mind. Knowledge is the attribute of Deity, and the characteriſtic mark of man; it is what places him above other animals, ſets him at the head of creation, and makes him lord of all. "Quid "enim eſt per Deos optabilius ſapientia? "Quid homini melius? Quid homine dig-"nius? Hanc igitur qui expetunt philoſophi "nominantur; nec quidquam aliud eſt phi-"loſophia, ſi interpretari velis, quam ſtu-"dium ſapientiæ." Cic. de Off. l. 2.

The preſent age is happy in an improved philoſophy; and as every ſyſtem of philoſophy has had its contemporary ſyſtem of phyſic, ſo is medicine peculiarly fortunate in theſe days, to have received improvements, and verged towards perfection. The laſt fifty years have added more to the healing art, than five preceding centuries. Phyſiology has been explored, pathology improved,

and

and principles in medicine, like principles in philoſophy, attempted. Miſtaken notions of diſeaſes have been detected, practice corrected, and theory improved. The ſpecifics, the panaceas of former ages, have ſunk into oblivion. One, but one of the vegetable tribe remains, to which modern practice allows the name: this perhaps is uſurped, and cuſtom, not experience, ſanctions the appellation. Of words I will not diſpute. Whether *the Bark* is a catholicon, or entitled to the name of ſpecific, at preſent is of no importance: its efficacy has eſtabliſhed its reputation, and my experiments tend not to defame it.

So much has been already written upon this drug, that it may ſeem to require apology from any one who ſhall attempt to purſue the ſubject. Every medical practitioner, every dabbler in phyſic, nay every *old woman* in the country, knows the uſe of bark. It may therefore appear miſpent time, and an affront to the literati of the preſent age, to ſuppoſe that my performance will be read: "Omnibus enim temporibus fama & opi-"nione vulgi, ſagæ & aniculæ & impoſtores, "medicorum quodammodo rivales fuere, & "de curationum celebritate cum iiſdem fere "certarunt." Verulam, l. iv. c. 2.

Were my obſervations confined to the common ſpecies of cinchona, I ſhould indeed be open to cenſure, and liable to be thought preſumptuous; but my experiments have not been ſo confined. I have attempted to lay down clear ideas reſpecting one ſpecies now much in uſe, but the nature of which has been miſunderſtood, and a ſpecies likewiſe hitherto entirely unnoticed by Engliſh writers has been the object of my enquiry.

Not therefore to ſpend more time in apologizing for my performance, which muſt live or die by its own merit, I ſhall proceed to the firſt part of my work, and offer from Linnæus a botanical deſcription of the genus of cinchona, or the Peruvian bark.—The tree which produces this bark is claſſed among the Pentandria Monogynia, and the following is given as its definition.

Cinchona: Quinquina Condamin. Act. Gall. 1738.

Cal. Perianthium Monophyllum, ſuperum, quinquef. minim. perſiſtens.

Cor.

Cor. Monopetala, infundibuliformis. Tubus cylindraceus, longus. Limbus patulus, quinquef. acutus.

Stam. Filamenta quinque minima, antheræ oblongæ intra faucem corollæ.

Piſt. Germen ſubrotund. inferum. Stylus longitudine corollæ-ſtigma craſſiuſcul. oblongum ſimplex.

Per. Capſula ſubrotunda, Calyce coronata bilocularis à baſi verſus apicem bifariam dehiſcens.

Sem. Plurima, oblonga, compreſſa, marginata.

Obſ. Flos interdum demit quintam partem numeri in ſingulis partibus.

Such is the character of the genus, and of the ſpecies Linnæus enumerates but one, Cinchona (officinalis) panicula brachiata. L. Sp. Pl. 244.

If we are not miſtaken, we are at preſent acquainted with two other ſpecies, but we ſhall ſpeak firſt of the officinalis or *quilled Peruvian Bark.* Several authors have given the hiſtory of this article; we ſhall prefer that of Neumann, which we ſhall beg leave to give in his own words. " Cortex Peruvi-

“ anus, called from its efficacy againſt “ intermitting fevers Febrifugum Peruvianum, “ cortex antifebrilis & antiquartius; and from “ a cure performed by it on the lady of “ Count del Cinchon, viceroy of Peru, “ cortex china china, or chinchina, kinkina, “ quinquina, comitiſſæ, &c. was firſt brought “ into Europe in the year 1649, by Cardinal “ de Lugo, who was then the Spaniſh “ viceroy in the Weſt Indies. It continued for “ ſome time a very lucrative ſecret in the “ hands of the Jeſuits, who reduced it into “ powder, the better to diſguiſe it, and ſold it “ for its weight in gold: whence its names “ Pulvis Jeſuiticus, Pulvis Patrum, Pulvis “ Cardinalis de Lugo*. The tree called

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* “ Ce ne fut comme on ſait, qu'en 1649, que l'on “ commença à avoir quelques notions du quinquina par “ les rélations du Cardinal de Lugo & des Jeſuites à leur “ retour en France. Trente annees s'ecoulerent encore “ depuis cette epoque avant que les medecins ſe “ determinaſſent à le preſcrire aux malades avec cette confiance “ que meritent en général les ſpecifiques & qu'il a acquis “ depuis. En 1679 un Anglois nommé Talbot, le mit “ en vogue, & Louis le grand acheta de lui la maniere de “ le preſcrire & ſes doſes. Depuis cette epoque juſqu' à “ ce jour le Perou ſeul étoit en poſſeſſion de fournir du “ quinquina à l'Europe, & on n'avoit point encore fait

“ by Ray Arbor febrifuga Peruviana, china
“ china, & quinquina & ganaperide dicta,
“ is plentiful on the hills near the city Loxa,
“ in the province of Quito in Peru. It is
“ ſaid that the trees which grow at the
“ bottom of the hills have the thickeſt bark,
“ ſmooth and whitiſh on the outſide, clear
“ or yellowiſh brown within, the leaſt bitter
“ and of the leaſt virtue; that the bark of
“ thoſe on the top is ſomewhat bitterer,
“ thin, full of protuberances, of a blackiſh
“ colour on the outſide, and of a dark brown
“ within. That thoſe produced about the
“ middle height yield the bittereſt and beſt
“ bark, not ſo ſmooth and pale coloured as
“ the one, nor ſo rugged and dark coloured
“ as the other. Vaillant, a celebrated bota-
“ niſt at Paris, aſſured me that he knew ſix
“ ſorts, and confirmed the account given by
“ Lemery* and Pomet, that Potoſi affords
“ the

“ uſage de celui qui croit dans d'autres contrèes. Il en
“ exiſtoit cependant à Saint Domingue, dans le Nouveau-
“ Mexique & à la Martinique.” Vid. Journ. de Phyſ.
Marſ. 1781. (M. Mallet.)

* “ Eſt l'ecorce d'un arbre apellè kinakina ou canna-
“ perida, qui croit au Perou dans la province de Quitto,
“ ſur

“ the beſt; that this is much browner, “ bitterer, more aromatic and more pungent, “ than the bark of Quito. But our buſineſs “ is to chuſe the beſt of what is brought to “ us. This is externally of a blackiſh brown, “ and internally of a dark cinnamon colour, “ ſomewhat unequal on the ſurface; com- “ pact, firm, and not eaſy to break; of a “ moderately bitter, aſtringent taſte, with a “ mixed kind of aromatic and muſty flavour. “ The large thick pieces are ſeldom good. “ Thoſe which are rolled up into quills like “ cinnamon, are apt to have foreign matters “ lodged within, and therefore ſhould be “ broke and examined before we pulverize “ them for uſe.” Vid. Lewis's edit. of Neum. Chem. p. 90.

“ ſur des Montagnes proche la ville de Loxa; il eſt à peu “ près grand comme un ceriſier: ſes feuilles ſont rondes, “ dentelées, ſa fleur eſt longue, de couleur rougeatre, elle “ eſt ſuivie d'une gouſſe qui contient une amande plate, “ blanche, envelopée d'une membrane mince. Il y a deux “ eſpéces de kinakina, l'un eſt cultivè & l'autre ſauvage, “ le cultivè eſt de beaucoup preferable à l'autre, les “ Eſpagnols l'appellent palo de calenturas, c'eſt-à-dire le “ bois des fievres.” Vid Lemery's Dictionaire ou Traitè Univerſel des Drogues Simples, p. 287.

The conciſeneſs of this hiſtory will probably be a recommendation, and I ſhall be excuſed from entering more minutely into circumſtances which border greatly on conjecture. Accident has given riſe to the introduction of many remedies; and the ſtory of an Indian being cured of an ague by drinking at a pond, into which ſome trees of the cinchona had accidentally fallen, wears ſome degree of probability, as we are well acquainted with the good effects of a cold infuſion: but whoever wiſhes to inveſtigate more fully the hiſtory of this article, may conſult the authors on this ſubject, the principal of whom are comprized under the following:

SYNONIMA OF THE BARK.

Cortex. Cortex Peruv. china china, quinaquina offic. Arbor febrifuga peruviana, Jonſ. de Dr. 476. Arbor febrifuga peruviana: China chinæ, & quinquina, & gannana peride dicta: Hiſpanis palos de calentura: Cortex arboris, Cortex peruvianus vulgo dicitur, inque pulverem redactus, pulvis patrum (ſcilicet jeſuitarum) & pulvis Cardinalis de Lugo; Angliæ the Jeſuit's Powder, R. H. 1796.

1796. China chinæ, Schroederi, App. p. 30. Cortex peruvianus, ſeu china chinæ, Morton, pyrit. elog. exercit. 1. c. vij. Cortex peruvianus, peruanus, China chinæ, quinquina offic. Dale 291. Kina-kina, Cortex peruvianus, & cortex febrifugus offic. Vulgo Quinquina, Geoff. Mat. Med. 11. 179. Arbre de quinquina, Mem. Acad. R. 1738, p. 319. Cinchona Lin. G. P. 1021, p. 526. The Jeſuit's bark, or the bark, or Peruv. bark. Vid. Quinaquina, Alſton's Lect. on Mat. Med. Lect. 47. p. 11. Vol. II. by Dr. Hope. Kinakina, kinaquina, chinachina, chinacanna, Lemery, p. 287.

CHAP. II.

Experiments on the Cinchona Officinalis.

I SHALL eſteem it altogether unneceſſary to preſent a detail of the labour of others on this ſubject. Mr. Boulduc, Lewis, and Dr. Percival have thrown conſiderable light on this and other articles of the Materia Medica, but I know of no author that has given the general analyſis which I here attempt. Of what has already been done, I ſhall have to take notice in different parts of this work, and ſhall therefore proceed to relate my experiments in the following order:

WITH WATER.

Exp. 1. Half an ounce of the beſt common Peruvian Bark, reduced to fine powder, was infuſed twenty-four hours in eight ounces of pure diſtilled water. The infuſion was of a light, yellowiſh brown colour, and had a pleaſant, aromatic, aſtringent, and ſlightly bitter taſte *.

WITH WATER AND HEAT †.

Exp. 2. Half an ounce of the ſame bark in coarſe powder, was boiled in one pound

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[*] M. Mallet, whoſe name we ſhall have frequent occaſion to mention under the article quinquina-piton, has given us ſome experiments on the common ſpecies of the bark, with which we ſhall here preſent the reader. “1. Deux onces de quinquina du perou groſſierement “pulvériſè, mis en macération dans deux pintes “d'eau froide, le mêlange ſouvent & fortement agité “pendant huit jours, il s'en degagea une grande quantité “d'Air qui produiſit une mouſſe abondante. Cette “liqueur filtrée par un papier gris, parut jaunatre, louche “& amére.”

[†] “2. Une chopine d'eau bouillante, verſée ſur le réſidu “et filtrée, douze heures après, donna une liqueur, plus

and an half of pure diſtilled water, to half a pint, then paſſed through a linen cloth and ſet in a cool place. In twenty-four hours the liquor was found more opake than in the former experiment; of a beautiful yellow, brown colour, and of a much more bitter taſte. A copious precipitation was obſerved at the bottom of the veſſel.

" jaune & plus amére, la même infuſion reiterée fournit
" une liqueur à peu près ſemblable."

" 3. Le même réſidu ſoumis à une ebullition de ſept à
" huit minutes dans une chopine d'eau, & reiterée trois
" fois, le produit des deux premieres decoctions etoit
" d'un jaune foncé, trouble d'une ſaveur amére & le pro-
" duit de la troiſième, étoit plus foible à l'oeil & au gout
" que les deux autres."

" 4. Le même réſidu, après avoir étè arroſé d'eau
" bouillante verſée à pluſieurs repriſes, juſqu' á lui oter
" toute ſaveur, fut mis en digeſtion dans un peu d'eſprit
" de vin, auquel il donna une couleur ambrée ſans amer-
" tume : on mit enſuite le ſeu au réſidu, qui brula très
" promptement ſans repandre d'odeur particuliere, & ne
" fournit pas un atome d'alkali fixe par l'incineration.

" 5. Toutes les liqueurs qui ayant ſervi aux infuſions,
" & lotions, reunies et formant environ quatre à cinq
" pintes furent filtrées, paſſerent très lentement, et furent
" miſes enſuite à évaporer. Elles ſe troublerent beaucoup
" pendant cette opération, furent refiltrées deux fois; &
" enfin, l'évaporation terminée, elles laiſſerent ſur une
" aſſiette de fayance deux gros d'un extrait ſec, brillant,
" s'humectant à l'air. Journal. de Phyſique, Mai 1780.

With proof Spirit.

Exp. 3. One ounce of the ſame bark in coarſe powder, was infuſed in eight ounces of proof ſpirit for fourteen days, the veſſel being frequently ſhaken. On examination, it was found of a beautiful dark brown colour, perfectly tranſparent, and had the bitter aſtringent taſte of bark. On the addition of water, it became turbid, reſembling, in appearance, the decoction; and on ſtanding at reſt ſome time, let fall a copious precipitate, leaving the liquour tranſparent.

With Acids.

Exp. 4. One ſcruple of the bark in powder, was infuſed in ſpt. vitrol. ten. ℥i. for the ſpace of twenty-four hours. On examination, it had acquired very little colour; and when diluted with water, had only an acid taſte.

Exp. 5. To one ſcruple of the ſame bark was added aq. fort. dup. ℥i. In twenty-four hours the whole ſubſtance of the bark diſappeared, and a yellow matter, ſomething like ambergriſe, was found floating on the ſurface, and ſticking to the ſides of the veſſel. On the addition of water, the taſte was only acid, but on the addition of alkali the liquor changed from a yellow to a brown colour, and the bitter taſte of the bark was perceptible.

Exp. 6. To one ſcruple of the ſame Peruvian bark, was added one ounce of ſpt. ſal. marin. In twenty-four hours it had acquired a ſlight blackiſh tinge; had no taſte of the bark when diluted with water; but on the addition of alkali, a very ſlight bitter was perceived.

Exp. 7. One ſcruple of the ſame bark was infuſed twenty-four hours in one ounce of acetum diſtillatum, the colour was ſcarcely changed, and it appeared to poſſeſs no properties of the bark.

WITH ALKALIES.

Exp. 8. One ſcruple of the beſt common Peruvian bark, in powder, was infuſed with the ſame quantity of vegetable alkali, in one ounce of water. In twenty-four hours the infuſion was of a beautiful dark brown colour, but had no taſte of the bark. The addition of acid produced a ſlight bitter taſte.

Exp. 9. One ſcruple of the ſame bark was infuſed in an ounce of water, with a ſcruple of foſſil alkali. The colour of the infuſion and other circumſtances, were nearly the ſame as in the former experiment.

Exp. 10. One ſcruple of the ſame bark, in powder, was infuſed in one ounce of ſpt. corn. cervi. In twenty-four hours a dark brown pellicle floated on the top of the liquor, which was tranſparent, and of a brown colour. A kind of precipitation was obſerved on the ſides of the veſſel, eſpecially near its bottom. When diluted with water it had no taſte of the bark; and on the addition of acid, the bitter taſte was leſs perceptible than in the former experiments.

WITH FIXED ALKALIES.

Exp. 11. To one ſcruple of the bark, in powder, was added one ounce of ſpt. ſal ammon. c. calce. In twenty-four hours a beautiful dark brown colour was produced, and ſomething like a depoſition or precipitation ſeemed to have taken place. When diluted with water, no taſte of the bark was perceptible; but on the addition of acid, a bitter taſte was perceived more manifeſtly than in any of the former experiments.

WITH

WITH NEUTRAL SALTS.

Exp. 12. One ſcruple of the bark was infuſed with one ſcruple of nitre, in one ounce of water, for twenty-four hours, during which time it had acquired little colour, and leſs taſte.

Exp. 13. Of cream of tartar, and the beſt common bark, in powder, each one ſcruple, was infuſed in one ounce of water for twenty-four hours: the infuſion had acquired little colour, but a ſlight bitter taſte.

EXPERIMENTS ON THE SIMPLE INFUSION OF BARK.

Exp. 14. To two ounces of the infuſion, prepared as in Exp. 1. were added gtt. x. of the tinct. martial. A dark inky colour, reſembling that with the infuſion of galls, and chalybeates, was inſtantaneouſly produced, and a copious precipitation was obſerved, after the mixture had remained at reſt ſome hours.

Exp. 15. To two ounces of the ſame infuſion were added ſpt. vitriol. ten. gtt. xx. The liquor was rendered turbid, and a ſlight precipitate was let fall. The acid taſte was not conſiderable.

EXPERIMENTS ON THE SIMPLE DECOCTION OF BARK.

Exp. 16. To two ounces of the decoction prepared as in Exp. 2. and poured off without ſhaking the phial, after having ſtood twenty-four hours, were added gtt. x. of the tinct. martial. The black colour and precipitation, were greatly inferior to the ſame experiment with the infuſion.

Exp. 17. To two ounces of the decoction, were added gtt. xx. of ſpt. vitriol. ten. The acid taſte was leſs prevalent, and the precipitation more copious than in the ſame experiment with the infuſion.

EXPERIMENTS ON THE TINCTURE OF BARK.

Exp. 18. To one ounce of the tincture prepared as in Exp. 3. were added gtt. x. of tinct. martial. The mixture very ſoon became of a deep inky black colour, and let fall a copious precipitation.

Exp. 19. To one ounce of the ſame tincture, were added gtt. xx. of ſpt. vitriol. ten. The mixture was rendered turbid, and a copious depoſition enſued.

MIS-

MISCELLANEOUS EXPERIMENTS.

The following experiment was made, with a view of aſcertaining the quantity of reſinous extract yielded from the quilled bark.

The experiment was conducted with great care in the laboratory of a druggiſt in London.

Exp. 20. Four pounds of the beſt bark, in coarſe powder, were put into a large glaſs retort, to which were added four gallons of rectified ſpirit of wine. The veſſel was then placed in another large veſſel of water, over the fire, and kept nearly in a boiling heat for 24 hours.

As the ſpirit diſtilled over it was again returned, and the proceſs thus continued till the whole was thought to be fully ſaturated. It was then evaporated, and *eight ounces* of reſinous extract obtained. This is the common method uſed by the druggiſts for obtaining the ſpirituous extract, but was here conducted with particular caution.

Exp. 21. One pound of the beſt quilled bark, in coarſe powder, was boiled in two gallons of water. The liquor filtered and evaporated to the common pilular conſiſtence, was found to yield five ounces, two drams, two ſcruples, and ſeven grains of gummy extract.

Exp. 22. One dram of lean raw beef was ſuſpended by a thread in a phial, containing two ounces of the infuſion of quilled bark. The meat continued four days perfectly ſweet, though it was expoſed in a window to a ſouth-weſt aſpect. The ſame quantity of meat kept in ſimilar circumſtances, in two ounces of water, as a ſtandard to this and the other experiments on the red and Caribbæan bark, was putrid in twenty hours. On the fifth day, the beef in this experiment with common bark, began to ſmell fœtid, and on the ſixth was perfectly putrid *.

Exp. 23. Half an ounce of quilled bark in powder, was infuſed in four ounces of red-port wine. In four days the colour of the liquor was very little changed. The taſte was agreeably bitter, and a black colour produced on the addition of chalybeates.

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* This experiment ſhews, that the infuſion of common bark is more antiſeptic than either the red or Caribbæan bark. Dr. Saunders informs us, that Mr. Skeete had found the red bark more antiſeptic than the common: I have the higheſt reſpect for my friend Mr. Skeete's abilities, but muſt doubt his accuracy in this experiment. I had inſtituted a ſet of experiments on the antiſeptic powers of the decoctions, but an accident prevented me from drawing any concluſion on the comparative virtues of each.

Exp. 24. Half an ounce of quilled bark in powder, was infuſed in four ounces of white-port wine. In four days the liquour had acquired an agreeable bitter taſte, and ſtruck a black colour with chalybeates.

Theſe are all the experiments which I ſhall at preſent relate. Many more were made, and more might be ſuggeſted, but the preſent will anſwer the purpoſe of the preſent enquiry. We ſhall therefore proceed to lay before the reader, the concluſions which we have deduced, in the following chapter.

CHAP. III.

Concluſions from the Experiments.

WE ſhall now attempt to draw ſome concluſions from our experiments, and in this chapter endeavour to inveſtigate the nature and properties of the Peruvian bark. The following appear to us natural inferences.

1. The cinchona officinalis is a powerful aſtringent,

2. This principle reſides in a gum which is ſoluble in water, and more readily by cold maceration than coction.

3. The Peruvian bark contains a bitter principle, which is a reſin.

4. The aſtringent gum and bitter reſin are ſo combined, that by the aſſiſtance of the former, part of the latter is ſuſpended in water, even by cold maceration.

5. Coction extracts powerfully the reſin, though it evaporates or diminiſhes the aſtringent principle.

6. Proof ſpirit diſſolves both the aſtringent and bitter principles, and is the only proper menſtruum of the latter.

7. Vinous ſpirit has the ſame effect as proof ſpirit, though in a leſs degree.

8. Concentrated acids entirely corrode or diſſolve the bark. The weaker acids have little effect on the ſubſtance of the bark, and when added to its ſolutions in water or ſpirit, precipitate its active parts.

9. Common alkalies prevent its ſolution in other menſtrua; volatile alkali does not extract its virtues; and cauſtic volatile alkali forms but a weak preparation.

10. The Peruvian bark is a powerful antiſeptic. Of what advantage theſe facts are to medicine, medical practitioners muſt decide. They differ in ſome meaſure from the concluſions which other writers have drawn; but accuracy in experiment, muſt here be conſidered as the teſt of truth. It is with great deference that I mention the reſpectable authority of Dr. Percival, from whom I am obliged to differ. "The Peruvian bark, ſays "he, and many other vegetable bitters and "aſtringents, yield their virtues as perfectly "to cold, as boiling water." If the aſtringent and bitter principles be different, and the latter a virtue of the Peruvian bark, undoubtedly the Doctor has erred in his concluſions. Again, he ſays, "2. As much of "the reſin of the bark is diſſolved by cold "maceration as by coction." The bitter taſte of the decoction, compared with the infuſion, is ſufficient objection to this concluſion; but the decoctions of the red and Caribbæan bark, put it beyond all doubt, that the bitter principle is more copiouſly yielded by coction than cold infuſion. In the latter ſpecies of bark, we have deſcribed the preſence of the reſin ſo plentiful in the decoction, as to

be precipitated from it in lumps on the addition of acid. The candour of Dr. Percival will readily excuſe theſe remarks, which we ſhall not attempt at preſent to enlarge. A comparative view of the powers of the different ſpecies of cinchona, will more properly be made in another place; we ſhall therefore haſten to our experiments on the red bark in the next ſection.

SECTION II.

ON THE CORTEX RUBER, OR RED PERUVIAN BARK.

CHAP. I.

The Hiſtory of the Red-Bark—Reaſons for believing it to be the Produce of the ſame Tree as the Quilled—Arguments in favour of its being a different Species of the Genus Cinchona.

THE firſt author who recommended the uſe of the red-bark, was Dr. Saunders, phyſician to Guy's hoſpital in London. His pamphlet has gone through ſeveral editions, and the medicine has come into pretty general uſe. At firſt ſight it may appear abſolute ſcepticiſm, a kind of arreſt on the judgment of practitioners, to hazard one word againſt this favourite remedy; but public opinion is always liable to public examination, and every unprejudiced perſon will candidly examine each ſide of a ſubject that even admits diſpute. Great as that gentleman's fame may be as a chemiſt and as a teacher of chemiſtry, I hope to make it appear, that he has been at leaſt miſtaken in his account of the red-bark; but we ſhall not at preſent ſpeak of its medical or chemical virtues. The natural hiſtory of this bark, is at preſent involved in ſome obſcurity. Its late introduction into this kingdom appears to have been the effect of chance. "In the year "1779," ſays Dr. Saunders, "a Spaniſh ſhip "from Liſbon bound to Cadiz, was taken "by the Huzzar frigate, and carried into "Liſbon; her cargo conſiſted chiefly of this "bark, ſome part of which was immediately "imported into this country, and a con"ſiderable quantity was bought at Oſtend, "at a very low price, by ſome of our "London druggiſts. The boxes in which "it was brought to Europe, were of the "ſame kind as thoſe in which the common "Peruvian bark was contained, and all ſold "by the general title of Quinquina. The "druggiſts in whoſe hands this red-bark at "firſt was, found it difficult to diſpoſe of it, "its appearance was ſo very unlike that of "common bark; at laſt they offered it by "way of trial, to ſuch apothecaries as reſided "in counties where agues are frequent; the

" ſucceſs attending its uſe," adds the Doctor, " ſoon convinced them of its ſuperior efficacy*."

There is no doubt but this remedy, ſoon after its importation into England, was introduced to the attention of medical practitioners; but as its fame appears now very much upon the decline, we may probably attribute its univerſal reception more to the notice taken of it by Dr. Saunders in his publication, than the real efficacy of the medicine. The red-bark is in much larger and thicker pieces than the common Peruvian bark. It appears to conſiſt of three diſtinct layers. The external coat is generally of a reddiſh brown colour, though ſometimes it has a light-coloured appearance, and is covered with a ſpecies of lichen or moſſy ſubſtance. The internal ſurface is of a deep red colour, and generally of a reſinous appearance. The middle layer is generally the thickeſt, moſt compact, of the darkeſt red colour, and appears to contain moſt reſin. The innermoſt coat has generally the moſt fibrous appearance, very often is of a bright red colour, and appears woody.

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* Vid. Dr. Saunders's pamphlet, p. 16.

In the firſt edition of his work, Dr. Saunders thought this bark was taken from the larger branches of the ſame tree that yields the quilled. The chief of his arguments were drawn from the analogy of other barks: thus the larger branches of the oak are ſaid to yield a bark, redder, rougher, and more aſtringent, than the ſmaller twigs of the ſame tree. Tanners are ſaid to prefer the larger oak bark; and the Doctor ſays, "I have "found, by comparing infuſions of both, "and ſubmitting them to the moſt deciſive "experiments regarding their aſtringency, "by adding to them ſolutions of iron, "that the precipitates were of a blacker "colour and in greater quantity, from the "larger and more compact pieces of bark, "than from the ſmaller twig-bark." Pag. 7.

The laſt would undoubtedly be a ſtrong argument, if the fact was as Dr. Saunders has repreſented; but if any faith is to be given to our experiments, the common bark is more aſtringent than the red: hence, admitting the aſſertion that the largeſt pieces of oak-bark are the moſt aſtringent, the argument falls to the ground, and there is no analogy in the caſe. The proof of the

Doctor's opinion, that the two barks are the produce of the ſame tree, proved ſo ſlight, that he relinquiſhes the idea in his laſt edition, and believes the red-bark to be either a variety or ſpecies diſtinct from the quilled. We are ready to give our aſſent to this opinion, which appears to be confirmed by a number of arguments. The royal medical ſociety at Paris has, ſince the death of M. Joſeph de Juſſieu, received ſeveral intereſting obſervations relative to the cinchona. This M. Joſeph de Juſſieu, was brother to the celebrated botaniſt Bernard de Juſſieu, and one of the French academicians who went to Quito in Spaniſh America, in order to aſcertain the figure of the earth. Dr. Antony de Juſſieu, his nephew, gave theſe valuable communications to the ſociety; from which it appears, that there are more ſpecies of the cinchona than what M. de la Condamine has deſcribed. He ſpeaks of a red, yellow, and knotty bark, all of which have very ſmooth leaves, purpliſh-coloured flowers, and an inodorous bark, bitter to the taſte, and more or leſs coloured. The tree that produces the red is ſaid to be exceeding ſcarce. In the year 1739, M. de Juſſieu found it growing in a very few places in the neighbourhood of Loxa. M. de Juſſieu ſeems to have preferred the red-bark; but it is a well known fact, that the inhabitants of Peru give the preference to the yellow and knotty; a circumſtance which ought to have ſome weight with thoſe who wiſh to try a remedy, of which they have had no experience. The yellow and knotty barks are ſaid to be diminiſhing ſo faſt, that it is to be feared that they will become extinct in that part of the world; and probably this may be one cauſe of the late importation of the red ſpecies into Europe, rather than any great eſtimation of its virtues; which would undoubtedly have occurred to the obſervation of the inhabitants of Peru long before the preſent period, if ſuch virtues had exiſted.

The ſame communication informs us of a ſpecies of white bark, which includes four varieties, all of which have broad, roundiſh, hairy leaves: the flowers are red, odoriferous, and furniſhed with hairs on their inſide ſurface. The outer bark has a whitiſh appearance, and the fruit is longer than that of the former ſpecies. The inner leaves in two of theſe varieties are of a reddiſh colour. They have a ſlight bitter taſte, and are ſaid to have a febrifuge quality when freſh, but which they ſoon loſe. The other two are white, and their bark inſipid, and of no efficacy. The trees that produce the yellow and knotty barks, were found growing in a valley that extends along the chain of the Andes, and in the diſtrict of Yungas, which is near it. About Loxa, in the fourth degree of S. lat: M. de Juſſieu ſaw foreſts of theſe trees; and we have the pleaſure to learn, that this valuable vegetable has been diſcovered in about the ſame degree N. lat.

Don Caſimir Ortoga, profeſſor of botany at Madrid, has lately, by order of the Spaniſh miniſter for the American department, ſent ſpecimens of two ſpecies of cinchona to the royal medical ſociety at Paris, which were lately diſcovered in the province of Santa-Fe in America, 4 deg. and half North lat. One of theſe ſpecies reſembles a ſpecimen of red-bark, now in M. de Juſſieu's *Hortus Siccus*, which was ſent by M. la Condamine from Peru; the other is a white bark. As a river that runs through the province of Santa-Fe empties itſelf near the harbour of Carthagena, we may hope to reap the benefit of this diſcovery *. This is all the information we have been able to collect reſpecting the different ſpecies of bark; and as we can no longer entertain a doubt of there being ſeveral ſpecies as well as varieties of the cinchona, the probability is, that the red-bark is a different ſpecies from the quilled.

The red-bark has hitherto been the ſubject of few publications. Mr. Rigby, an ingenious ſurgeon at Norwich, has publiſhed a number of caſes greatly in its favour; but he relies ſo much on Dr. Saunders's experiments, as to judge it "unneceſſary to give a chemical analyſis of it." An apothecary at Bruges has lately publiſhed a pamphlet on this article, in the Flemiſh tongue, but I was not fortunate enough to procure it in Flanders. An ingenious gentleman of Bruges, whom I met with at Oſtend, deſcribed it as a nonſenſical jargon of words; but I muſt reſerve my opinion till I receive the performance, which I hope to do, with ſome other publications from the Continent, very ſoon. I know of no other author on this

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* Vid. Dr. F. Simmons's ingenious Letter to Dr. Saunders, p. 168. laſt edit.

this ſubject. Having therefore availed myſelf of the writings of others in this chapter, I proceed in the next to offer my experiments on this bark, in the ſame order as I did in the firſt part of this work on the quilled ſpecies.

CHAP. II.

Experiments on the Red Peruvian Bark.

WITH WATER.

Exp. 1. HALF an ounce of genuine red bark, reduced to fine powder, was infuſed twenty-four hours in eight ounces of pure diſtilled water. The liquor was found of a ſlight red brown colour, had a more bitter but leſs aſtringent taſte than the ſame experiment with the common bark.

WITH WATER AND HEAT.

Exp. 2. Half an ounce of the ſame bark, in coarſe powder, was boiled in one pound and half of pure diſtilled water, to eight ounces, then paſſed through a linen cloth and ſet in a cool place. In twenty-four hours, the liquour was found more opake than the infuſion. Compared with the decoct. cort. com. the taſte was bitterer, and the precipitation much more copious. The two decoctions differed in every reſpect, much more than the two infuſions. The reſinous matter was ſo copiouſly depoſited on the ſides of the veſſel that contained this decoction, that it reſembled very much ſaline cryſtallizations.

With Proof Spirit.

Exp. 3. One ounce of the ſame bark, in powder, was infuſed in eight ounces of proof ſpirit for fourteen days, the veſſel being frequently ſhaken. It was then found of a beautiful dark brown colour, inclining to red, and had a pleaſant bitter aſtringent taſte. With water it exhibited the ſame appearance as the common tincture.

With Acids.

Exp. 4. One ſcruple of the red bark in powder, was infuſed in ſpt. vitriol. ten. ℥i. for the ſpace of twenty-four hours. The reſult was ſimilar to the ſame experiment with common bark, except that the liquor was a little more tinged with red.

Exp. 5. One ſcruple of the ſame bark was infuſed in aq. fort. dup. ℥i. In twenty-four hours this experiment exhibited the ſame phænomena as deſcribed in Exp. 4. with common bark, except that the colour inclined more to red.

Exp. 6. One ounce of ſpt. ſal. marin. added to one ſcruple of the powder of red bark, in twenty-four hours produced a tincture of a reddiſh brown colour; but on the addition of water, no taſte of the bark was perceived, and with alkali, only a very ſlight bitter taſte was produced.

Exp. 7. One ounce of acetum diſtill. in twenty-fours appeared to have had no effect on one ſcruple of the powder of red bark.

WITH ALKALIES.

Exp. 8. One ſcruple of the red bark, with the ſame quantity of vegetable alkali, was infuſed in one ounce of water. In twenty-four hours the liquor had acquired but a ſlight red colour, had no taſte of the bark when diluted with water, and on the addition of acid manifeſted but a very ſlight bitte taſte.

Exp. 9. One ſcruple of the ſame bark wa infuſed in an ounce of water, with a ſcrupl of foſſil alkali. The colour of the infuſio was a little deeper, but other circumſtance as in the 9th Exp. deſcribed under the ſectio of quilled bark.

Exp. 10. One ounce of ſpt. corn. cerv was added to one ſcruple of the red bark The pellicle, precipitation, and other circumſtances, differed only in colour from the ſam Exp. with common bark.

Exp. 11. To one ſcruple of the red bark in powder, was added one ounce of ſpt. ſal ammon. c. calce. In twenty-four hours th colour was a beautiful red brown. A precipitation appeared to have taken place on th ſides of the veſſel. Dilution with wate produced no taſte of the bark, but the additio of alkali produced a precipitation of a bitte taſte.

With Neutral Salts.

Exp. 12. Of the red Peruvian bark an nitre, each one ſcruple, were infuſed in one ounce of water for twenty-four hours. The liquor was ſcarcely diſcoloured, and had no taſte of the cortex.

Exp. 13. One ſcruple of the ſame bark, with a ſcruple of cream of tartar, was infuſed in one ounce of water for twenty-four hours; the liquor was tranſparent, and had a very ſlight bitter taſte. The addition of a few drops of tinct. mart. produced but a very ſlight blackiſh tinge.

EXPERIMENTS ON THE SIMPLE INFUSION OF RED BARK.

Exp. 14. To two ounces of the infuſion prepared as in Exp. 1. were added gtt. x. of the tinct. martial. The blackneſs was at firſt ſlight, conſiderably inferior to the ſame experiment with the infuſion of the quilled, and the precipitate by no means ſo copious *.

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* This experiment was repeated in the preſence of ſeveral chemiſts, and when compared with the ſame experiment on the common infuſion, it was unanimouſly agreed that this mixture was conſiderably the blackeſt. Dr. Saunders has drawn a different concluſion, but a repetition of this experiment will readily convince any unprejudiced perſon; and if intenſity of blackneſs is any proof of ſuperiority in aſtringency, we have in this experiment, a deciſive proof of the ſuperior aſtringency of the quilled bark.

Exp. 15. To two ounces of the ſame infuſion, were added ſpt. vitriol. ten. gtt. xx. The liquor was rendered turbid, let fall a more copious precipitation, and diſguiſed the acid taſte more than in the ſame experiment with the quilled ſpecies.

EXPERIMENTS ON THE DECOCTION OF RED BARK.

Exp. 16. To two ounces of the decoction of red bark, were added gtt. x. of the tinct. martial. A purple colour was produced, very different from the inky blackneſs in the preceding experiments, and the liquor continued long without letting fall any precipitate. After ſtanding twenty-four hours, it ſcarcely could be ſaid to be of a black colour*;

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* It is to be wiſhed, that Dr. Saunders had given us an experiment of this kind: it is one which manifeſts at once the ſuperior aſtringency of the common bark, and explains the nature of the aſtringent principle. The decoction abounds more in reſin than the infuſion, yet on the addition of chalybeates it manifeſts leſs aſtringency. The concluſion is plain, the reſin is not the aſtringent, but the bitter principle. Dr. Saunders indeed, is not the firſt author who has miſtaken this matter. The ingenious Dr.

and the difference was more ſtriking betwixt the two ſpecies of cortex in this, than in any other experiment before deſcribed.

Exp. 17. To two ounces of the decoction were added gtt. xx. of ſpt. vitriol. ten. The acid taſte was more diſguiſed, and the precipitation conſiderably more copious than in the ſame experiment with common bark.

Dr. Lewis ſays, "The aſtringency of the cortex reſides wholly in its reſin, which is not ſoluble in watery liquors." Neumann's Chem. p. 339, Note.

Dr. Percival long ago detected this error; and we cannot help being rather ſurpriſed, that Dr. Saunders ſhould not have been acquainted with this diſcovery, as he ſpeaks of the Doctor in terms of reſpect due to ſo accurate a writer, and has taken the 8th Exp. from his works.

We ſhall here ſubjoin two experiments, which prove, beyond a doubt, the truth of the remark that the gum is the aſtringent principle.

Exp. 1. One ſcruple of the watery extract, was diſſolved in one ounce of diſtilled water. To the mixture were added gtt. v. of the tinct. martial. The liquor immediately became of an inky black colour, greatly ſuperior to that produced by the following,

Exp. 2. One ſcruple of the reſinous extract of bark, was diſſolved in one ounce of rectified ſpirit. To the mixture were added gtt. v. of the tinct. flor. martial. A black colour was produced, but greatly inferior to that produced by the preceding experiment.

EXPERIMENTS ON THE SPIRITUOUS TINCTURE OF RED BARK.

Exp. 18. To one ounce of the tincture, were added gtt. x. of the tinct. martial. The whole became ſoon of a deep black colour.

Exp. 19. To one ounce of the ſame tincture, were added gtt. xx. of ſpt. vitriol. ten. The mixture was rendered turbid: the acid taſte ſcarcely perceptible, and a copious precipitation let fall.

MISCELLANEOUS EXPERIMENTS.

Exp. 20. Four pounds of the beſt red bark, reduced to coarſe powder, were digeſted with four gallons of rectified ſpirit, for twenty-four hours, as deſcribed under the 20th Exp. with common bark. By evaporation, *twelve* ounces of reſinous extract were obtained.

Exp. 21. One pound of the beſt red bark was boiled in two gallons of water. The liquor ſtrained and evaporated to the common pilular conſiſtence, yielded five ounces and half a dram of gummy extract.

Exp. 22. One dram of lean raw beef, was put into a phial containing two ounces of the infuſion of red bark, prepared as in Exp. 1. After having ſtood forty-eight hours in a window, expoſed to a ſouth-weſt aſpect, in the month of Auguſt, it began to emit bubbles of air, and manifeſt ſigns of putreſcency; in three hours more it began to ſmell offenſively, the liquor loſt its tranſparency, and in ſix hours more the meat was perfectly corrupt. —The ſame quantity of beef, kept as a ſtandard in two ounces of water, was putrid in thirty-ſix hours.

Exp. 23. Half an ounce of red bark in powder, was infuſed in four ounces of red port wine. In four days the colour of the liquour appeared the ſame as at firſt. The taſte was agreeably bitter, and chalybeates rendered the infuſion black.

Exp. 24. Half an ounce of red bark in powder, was infuſed in four ounces of white port wine. In four days the colour inclined to a beautiful red. The liquor had an agreeable bitter taſte, and manifeſted conſiderable aſtringency on the addition of chalybeates.

C H A P III.

Concluſions from the Experiments on the Corte Ruber, or Red Peruvian Bark.

THE ſame general concluſions may b drawn reſpecting the nature and properties of the red bark, as we have befor attempted on the cinchona officinalis. W ſhall not therefore repeat what we have ſai in a foregoing chapter, but confine ourſelve chiefly to a comparative view of the virtue of each.

Every experiment that we have related tends to ſhew the analogy betwixt the tw ſpecies. We find the red bark, 1. An aſtringent. 2. A bitter, and 3. An antiſeptic.

As theſe experiments were made conjointl with thoſe on the common bark, we were abl to attend minutely to every circumſtanc which could mark a difference; and we foun that the latter manifeſted greater ſigns o aſtringency, and yielded more watery, o gummy extract, whilſt the red ſpecie abounded more in reſin, and yielded a more copious ſpirituous extract.

To aſcertain the exact quantity which each ſpecies yields per pound, will ſcarcely appear a matter of much importance, as different ſpecimens yield different quantities, according to the quality of the bark.

M. Boulduc obtained from a pound of bark only five drams and a ſcruple of ſpirituous extract. Neumann tells us, that "a "pound yielded, with rectified ſpirit, ten "drams and two ſcruples of reſinous; and "afterwards, with water, five drams of "gummy extract. On applying water at "firſt, ſays he, I obtained ſeven drams and "a ſcruple of gummy, and afterwards, by "ſpirit, ſix drams of reſinous extract." "Neumann's Chemiſtry, p. 90.

Dr. Lewis tells us, that he obtained a much larger proportion of reſinous extract than what Neumann mentions.

According to our experiments, the quilled bark invariably yields more gummy or watery extract than the red, and the latter more ſpirituous or reſinous extract. To aſcertain the ſpecific quantity of each is a matter of no importance; we have given the reſult of our enquiries, under the ſeparate chapter of experiments; and for the benefit of a ready compariſon, ſhall ſubjoin a view of the ſeparate quantities,

Four pounds of red bark, yield of ſpirituous extract,	twelve ounces.
Ditto of quilled bark,	eight ounces.
One pound of quilled bark, yields of watery extract,	five ounces, two drams, ℈ij. and ſeven grains.
Ditto of red bark,	five ounces and half a dram.

We are ſorry to be obliged to differ from Dr. Saunders and his friends, on ſeveral queſtions relative to the red bark. Though we believe the reputation of this, or any other medicine is very little concerned by any opinions reſpecting its antiſeptic virtues, yet, as ſome perſons may be diſpoſed to attribute much to this ſuppoſed quality, it will be neceſſary to obſerve here, that our experiments prove the red bark to be a very weak antiſeptic, conſiderably inferior to the quilled bark, and not equal to the Cinchona Sanctæ Luccæ, whoſe powers of preventing putrefaction, in dead animal ſubſtances, are but weak.

Theſe are the concluſions which chemical inveſtigation tends to eſtabliſh, and a ſlight compariſon will ſhew how greatly they militate againſt Dr. Saunders's opinion; but it is not our wiſh to contraſt the reſults of experiments upon which accuracy and chemical knowledge muſt decide. When truth is oppoſed to error, no authority can reſiſt enquiry, and no power prevent detection; but it would be baſe, it would be ungenerous to purſue diſcovery to the detraction of merit. The brighteſt incident in the character of Hippocrates was, that he confeſſed his own errors. May every modern phyſician poſſeſs the candour of the father of phyſic, and not be aſhamed to acknowledge a miſtake into which inattention may have hurried him! From ſuch conduct can we alone expect unanimity and improvement in ſcience. Great minds are above mean actions; and great geniuſſes ſuperior to illiberal criticiſms. A man may have hands to diſcover inaccuracies, without a head capable of the thought that produced them. Miſtake is ſometimes the reſult of exuberant genius, at others the effect of an heated imagination, which miſleads the judgment. Cool experience corrects theſe ſallies of the mind; and we are ſurpriſed to find opinion change with time. Phyſicians have not been proof againſt this fluctility of thought; and even medicine, with all her affected wiſdom, bows the ſlave of faſhion.

The bark has long been a faſhionable remedy, but the red bark has lately been the *ton*; and we believe it requires nothing more than the ſanction of a great name, to bring the Caribbæan bark into vogue; but if the period of its aggrandization ſhould ever ariſe, we truſt its pretenſions will be better founded than thoſe of the red bark.

CHAP. IV.

On the Medical Effects of the Red Bark.

THE number of reſpectable names that are ſubjoined to Dr. Saunders's publication, makes me proceed with extreme caution to deliver my ſentiments on this part of my ſubject: I am not however without my authority, and names very reſpectful grace my opinion. Leſt I ſhould be miſunderſtood, I think it neceſſary here to premiſe,

miſe, that I am not writing againſt the red bark, or denying the many facts that have given riſe to its reputation in one part of this iſland. I have already endeavoured to ſhew, that its principles have been miſtaken; and as its uſe has been indiſcriminate, no wonder that we ſhould have diverſities of opinion. I am willing to allow that it may be preferable to the quilled, in ſome inſtances, though not as Dr. Saunders ſuppoſed by its ſuperior aſtringency, but rather on account of its bitterneſs. In what caſes this may give it the preference, is not eaſy to determine. There are agues which aſtringents alone, as alum, effectually cure: there are others in which bitters alone, as camomile flowers, abſinthium, or gentian, are the ſole remedies: in others again, and thoſe moſt frequent, the conjunction of theſe principles is neceſſary. Others yield not to any of theſe powers, but require the moſt diffuſible ſtimuli. To explain this curious fact may be difficult, probably paſt the power of art. I will here hazard a queſtion,—does it not ariſe from a peculiar modification of debility?

Not willing to admit the univerſal ſuperiority of the red bark, I will mention a few names, and from them a few caſes, in which the quilled proved preferable. My medical friends at Edinburgh, were never able to give aſſent to the *eclat* which the red bark had gained. My friend, Dr. Black, whoſe name I cannot mention without the moſt profound reſpect, informed me of a very ſingular caſe, which happened in the practice of a ſurgeon of conſiderable eminence in Edinburgh. A perſon had been ſome time afflicted with an ulcer, which diſcharged a fœtid, ill-conditioned pus; he was put under the uſe of bark, the diſcharge leſſened, and the pus improved. The ſurgeon happening to get ſome red bark, the patient was ordered to uſe it. The wound grew gradually worſe, the common bark was had recourſe to, and every favourable ſymptom returned with its uſe.

The phyſicians to the royal infirmary at Edinburgh, have now nearly laid aſide the uſe of the red bark. Dr. Hamilton, from whoſe friendſhip and judicious practice during three years attendance at the hoſpital I received great improvement, found the red bark totally inefficacious in the tertians and quartans of laſt ſpring. The ſame thing happened under the practice of Dr. Henry Cullen, and I could bring ſeveral practitioners to vouch the ſame in England. The following caſe was given me by a London practitioner. "A lady ſeven months advanced in pregnancy, was ſeized with an intermittent of the tertian type, and by the advice of her phyſician took two ounces of the powder of red bark in the courſe of twenty-four hours. She continued it in large doſes for a week, without any effect on the complaint, though it did not purge her. The common bark was had recourſe to, and cured the diſorder."

We have been told, that the red bark produces wonderful effects on the Continent; but Dr. Sandifort, profeſſor of anatomy at Leyden, informed me, when I viſited that place in July laſt, that he never could find out its efficacy, and now never preſcribes it. Holland is the country where agues are endemial; and no doubt the practice and obſervation of a man of Dr. Sandifort's reputation, muſt have weight with the impartial public. The phyſicians at Haerlem (if I am not miſtaken) informed me to the ſame effect. But I met with ſuch unexpected politeneſs from Dr. Van-Maurum, profeſſor of natural philoſophy, and keeper of the cabinet of natural hiſtory, that my time was ſo much taken up in viewing the curioſities of nature and of art, that I forgot for a while the ſtate of medicine. The authority which I have adduced, may plead apology for my apparent ſcepticiſm. To depreciate a medicine is not a pleaſant office, but to prevent miſtaken judgment, correct falſe opinions, and vindicate the character of an uſeful medicine, is an employment worthy the pen of every honeſt phyſician. The quilled bark appears to me to be unjuſtly loſing ground. When genuine, and in good order, I ſhall always prefer it as a powerful, grateful, warm aſtringent. Thoſe who think differently, have a right to act differently. Preſcription is a field of liberty, on which every phyſician may ride his hobby-horſe, provided he ſplaſhes not his neighbour or the ſick, and moſt undoubtedly he who chuſes may ride in red.

SECTION III.

ON THE CINCHONA SANCTÆ LUCIÆ, QUINQUINA-PITON, QUINQUINA DE LA MARTINIQUE, CARIBBÆAN, OR NEW-BARK.

CHAP. I.

The Hiſtory of the Cinchona Sanctæ Luciæ.

IN the month of November 1783, when I was purſuing my medical ſtudies in London, I firſt met with a ſpecimen of this bark. Mr. Wilſon, an ingenious apothecary in Henrietta-ſtreet Covent-Garden, communicated ſome ſpecimens and an account of this vegetable, to a medical ſociety held in Mr. Sheldon's theatre, Great Queen-ſtreet, Lincoln's-Inn-Fields. From the account delivered to the ſociety, and from an examination of the fruit of the plant, which was pretty well preſerved, there was no doubt but it belonged to the genus cinchona. Moſt of the eminent botaniſts in London are agreed upon this point; and my learned friend and preceptor, Dr. Hope, profeſſor of botany in the univerſity of Edinburgh, who has had an opportunity of examining this ſpecies, informs me, that he is of the ſame opinion. The colour of this bark is a dark brown, the pieces are of various ſizes, ſome ſmall and thin, rolled up like cinnamon, or the quilled bark: others of a larger kind. Some are covered with a white ſilver-coloured cuticle: others are externally of a much darker colour. When broke, it has a fibrous texture. Its taſte is at firſt aſtringent, ſlightly aromatic; but when it has remained ſome time in the mouth, exceedingly bitter, reſembling the bitterneſs of gentian. Its botanical character is thus defined: Cinchona. Floribus cymoſis Sanctæ Luciæ calyx quinquefidus. Corolla monopetala, infundibuliformis, laciniis linearibus. Piſtillum capitatum. Antheræ lineares. Semina multa, alata. Capſula biloculari ovali, ſtriata. Folia oblonga, diſticha. Habitat inter nemora, locis umbroſis, præcipuè ripa alicujus rivi.

We have likewiſe been favoured with the whole account of this vegetable from Mr. Wilſon, as received from Mr. Davidſon, ſurgeon in St. Lucia; and as the paper is prepared for publication in the Philoſophical Tranſactions, we ſhall not venture to tranſcribe it, but beg leave only to preſent our readers with the following extract.

" The bark-tree of this iſland is nearly " about the ſize of a cherry-tree, ſeldom " thicker than the thigh, tolerably ſtraight, " the wood light and porous, without any " of the bitterneſs or aſtringency of the bark " itſelf. It delights in a ſhady ſituation, the " north-weſt aſpect of hills, under larger " trees, and is generally to be found about " the middle of a hill, near ſome running " water. The leaves are large, oblong, " oppoſite, and plain, preſerving as well as " the flowers and ſeeds the bitter taſte of " the bark.

" In the beginning of the rainy ſeaſon " (June) the tree puts forth its flowers in " ſmall tufts. At firſt they are white, but " afterwards they turn purpliſh. The ſtamina are five in number, with a ſingle " ſtyle. The germen oblong, bilocular, " furrowed on each ſide. It burſts when " dry, and ſheds its two ſeeds, which are " covered with a feathery down. The ger-

" men in the bark of our iſland of St. Lucia,
" appears to be larger than that growing at
" Tobago, if I may judge from a drawing
" which I have ſeen. The other botanical
" characters correſpond. The ſoil in general
" where our bark grows, is a ſtiff red clay."

This is all I am able to give of the natural hiſtory of the Cinchona Sanctæ Luciæ; but though we are ſo little acquainted with it, the French appear to have paid attention to it ſome time ago. M. de Badier, an inhabitant of the iſland of Guadeloupe, was the firſt perſon who ſent to France an account of the bark-tree of Martinique, which in that iſland is known under the name of quinquina-piton. He carried ſome ſpecimens of it into France, and gave them to ſome eminent botaniſts and chemiſts, who ſeverally made their obſervations on the nature and qualities of this article. M. de Badier likewiſe communicated ſome important obſervations on the medical virtues of this bark, from which it appeared, that the ſurgeons and inhabitants had found it peculiarly beneficial in the bad fevers which rage in thoſe climates. M. Deſcemet, a diſtinguiſhed botaniſt, undertook to examine and compare the genus of this plant, with the deſcription of the common Peruvian bark; and in a memoir which he gave to the faculty of medicine, he proved the identity of the genus. His deſcription of the fruit of this vegetable, agrees ſo perfectly with that given by M. de la Condamine, of the fruit of the quinquina du Pérou, that it is impoſſible, adds he, to find any difference. In both, the calyx is *ſur le fruit*; and, as Tournefort ſays, the calyx becomes the fruit. In both the fruit is oval; it opens into two half pods, ſeparated by a partition, and lined with a yellow pellicle, ſmooth and ſlender, and which appears to be a prolongation of the partition. In both the ſeeds are flattened and turned backwards. They are both about half a line in diameter, are very ſlender towards the ends, and thick in the middle, which is of a brown colour, and contains the ſeed within its thickneſs betwixt two pellicles. The ſeeds which M. de la Condamine has compared with thoſe of the elm, are attached and diſpoſed in the manner of ſcales, on an oblong placenta, pointed at one end, and obtuſe at the other. This placenta is faſtened on each ſide to the ſmall partition. Many other circumſtances are ſimilar, and corroborate the opinion of their being of the ſame genus. In both, the leaves are oppoſite; and as M. Deſcemet had an opportunity of examining a living ſpecies of the cinchona officinalis in the king of France's garden, he has received every confirmation that he could wiſh of his aſſertion.

In the Hiſtoire des Maladies de Saint Domingue, Tom. II. pag. 231. we find a letter from M. Poupel Deſportes, king's phyſician in that colony, and correſpondent member of the Academie des Sciences, to his brother, written in the year 1747; in which he obſerves, that he had long ago given an account to M. de Juſſieu, of three ſpecies of bark, growing at St. Domingo, a deſcription of one of which agreed perfectly with that ſent from Perou by M. de la Condamine. M. Deſportes has named this ſpecies "Trachelium arboreſcens & fluviatile laurifoliis conjugatis floribus racemoſis, ſeu corymboſis albis capſulis conicis nigris." There is no doubt that this vegetable, which is here called trachelium, is of the genus of cinchona, and the ſame with what we are deſcribing. M. de la Planche, a gentleman well known for his accuracy in chemical experiments, has given an analyſis of the quinquina-piton, which ſerves to prove the good opinion we have formed of it, and points out the analogy betwixt it, and the common ſpecies of Peruvian bark. M. Mallet, Docteur Regent de la Facultè de Medecine, publiſhed in the "Memoires de la Seance publique de la Facultè de Medecine," a memoir ſur le quinquina de la Martinique, connu ſous le nom de quinquina-piton, an account of which is given in the Journal de Phyſique Mars 1781 (tom. xvii.) The author there obſerves, that the quinquina-piton "eſt large, "mince, fibreuſe, legere; depouilleè de ſon "epiderme, d'un gris brun foncè, d'une "Saveur *exceſſivement amere*." A character which correſponds exactly with what we have obſerved of the cinchona Sanctæ Luciæ. We cannot therefore any longer doubt the identity of this ſpecies of bark, with that deſcribed by the French writers; but muſt think it very extraordinary, that France ſhould ſo long have enjoyed a valuable remedy, with which we have been hitherto unacquainted. That we may recommend it more particularly to the attention of our countrymen, we ſhall venture to preſent the reader with a ſeries of experiments on this ſubject, obſerving nearly the ſame order that we have done in the preceding ſections; and we are happy to find, that chemical analyſis corroborates the opinion we have formed.

C H A P. II.

Experiments on the Cinchona Sanctæ Luciæ, or Caribbæan Bark.

Exp. 1. TWO drams of the Caribbæan bark, were infuſed for twenty-four hours in four ounces of diſtilled water. The infuſion was of a dark brown colour, and had a very bitter taſte like the flavour of gentian.

Exp. 2. Two drams of the ſame bark reduced to coarſe powder, were boiled in eight ounces of pure water to four. The liquor was paſſed through a linen cloth, and ſet by to cool. It had a brown appearance, more inclining to red or chocolate colour than the infuſion, and let fall an exceeding copious precipitation in cooling, reſembling ſaline cryſtallizations, and much more copious than thoſe deſcribed in Exp. 2. with red bark. The taſte was more nauſeouſly bitter than the infuſion.

WITH PROOF SPIRIT.

Exp. 3. One dram of the ſame bark in coarſe powder, was infuſed in two ounces of proof ſpirit for twelve days. The tincture reſembled very much in appearance the common tincture of bark*. Its taſte was much more agreeable, than either the infuſion or decoction.

WITH ACIDS.

Exp. 4. To one ſcruple of the ſame bark, was added one ounce of ſpt. vitriol. ten. The colour in twenty-four hours was rather deeper, but every other circumſtance nearly the ſame as in Exp. 4. with common bark.

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* " L'eſprit de vin agit puiſſament ſur les deux eſpeces " de quinquina.—La teinture du quinquina-piton eſt " plus amere,plus foncée en couleur, ſe trouble d'elle même " au bont de deux jours: ce qui n'arrive plus, lorſqu'elle " a eté filtrée. Elle ſe mele intimement a l'eau ſans perdre ſa nouvelle tranſparence, and laiſſe plus que *le quart* " de ſon poids d'un extrait d'un brun noir luiſant, tenace, " preſque d'une ſaveur d'aloës." M. Mallet.

Exp. 5. One ſcruple of the ſame in powder, was infuſed in one ounce of aq. fort. dup. which diſſolved this vegetable in the ſame manner as it did the two former ſpecies *.

Exp. 6. One ounce of ſpt. ſal. marin. was added to one ſcruple of the ſame powdered bark. In twenty-four hours it was rather of a darker colour, and not ſo tranſparent as in the ſixth experiment, with the common bark.

Exp. 7. One ſcruple of the ſame powdered bark, was infuſed in one ounce of acetum diſtill. which acquired little colour in twenty-four hours, but in three days had a bitter taſte, probably owing to the evapora-

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* " L'acide nitreux attaque rapidement les ſubſtances vegetales, & particulierement nos deux eſpeces de quinquina. Nous avons mis une egale quantité de ces deux ecorces a digerer dans cet acide : les deux ſolutions ont laiſſé, apres l'evaporation de toute l'humidité, un reſidu jaune leger, ſpongieux fort acide, animant un peu d'activité du feu, mais n'y' exercant pas la fulguration qui caracteriſe les ſels nitreux. Les reſidus, lavés à 'l'eau fraiche juſqu à perte dé toute acidité, ſe trouverent depouillès de ſaveur & de principe, entierement epuiſés : & c'eſt en vain qu'on a cherchè de l'alkali fixe apres l'incineration. Enfin les deux eſpeces de quinquina, miſes en' digeſtion, dans de la liqueur alkaline ont donné deux teintures rouges tres limpides." Ibid.

tion of part of the acid, as the mixture was expoſed to the air.

With Alkalies.

Exp. 8. One ſcruple of the ſame bark, with the ſame quantity of vegetable fixed alkali, was infuſed in one ounce of water. The colour was darker, but other circumſtances, ſimilar to Exp. 8. of the preceding ſections.

Exp. 9. To one ſcruple of the ſame bark, were added one ſcruple of foſſil alkali, and one ounce of water. In twenty-four hours the liquour was of a dark brown colour, had no taſte of the bark, but on the addition of acid a bitter taſte was produced.

Exp. 10. One ſcruple of the ſame bark, infuſed for twenty-four hours, in one ounce of ſpt. corn. cervi. exhibited the ſame appearances as the ſame experiment with common and red bark. The colour was rather darker, but on the addition of acid, ſcarcely any bitter taſte could be diſcerned.

Exp. 11. One ounce of ſpt. ſal. ammon. c. calce. was added to one ſcruple of the ſame powdered bark. In twenty-four hours the colour was a dark brown, and on the addition of acid, the liquor was rendered turbid, and a copious precipitation, with a bitter taſte, produced.

WITH NEUTRAL SALTS.

Exp. 12. To one ſcruple of the ſame powdered bark, were added one ſcruple of nitre, and an ounce of water. In twenty-four hours the colour of the infuſion was much ſuperior to the ſame experiment with common bark; and what appeared rather extraordinary was, that the ſurface of the liquor, in three days, became very mouldy, though it had continued in the ſame place with the other experiments, which were not affected in the ſame manner.

Exp. 13. One ſcruple of the ſame bark, infuſed with the ſame quantity of cream of tartar, in one ounce of water, for twenty-four hours, appeared to have yielded none of its virtues to the infuſion.

EXPERIMENTS ON THE SIMPLE INFUSION OF CARIBBÆAN BARK.

Exp. 14. To two ounces of the infuſion, prepared as in Exp. 2. were added gtt. x. of the tinct. martial. An intenſe black colour was immediately produced, much ſuperior to the ſame experiment with either of the other ſpecies; and on ſtanding, the precipitation was very copious.

Exp. 15. To two ounces of the infuſion, were added gtt. xx. of ſpt. vitriol. ten. The liquor was immediately rendered turbid, became of a lighter yellow colour, let fall a copious precipitation, and was of a leſs acid taſte than the ſame experiment with either of the other ſpecies.

* EXPERIMENTS ON THE DECOCTION OF CARIBBÆEN BARK.

Exp. 16. To two ounces of the decoction, were added gtt. x. of the tinct. martial. A black colour was produced, but much inferior to the ſame experiment with the infuſion.

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* "La grande amertume du quinquina-piton maſquant
" les autres qualités ſapides, pour decider s'il poſſedoit,
" auſſi bien que le quinquina du Perou, quelque principe
" aſtringent, nous les avons fait bouillir l'un, & l'autre
" dans l'eau non epurée de paſſy, qui a noirci ſur le champ.
" Nous les avons fait bouillir enſuite dans du vin rouge,
" dont ils ont precipité entierement la partie colorante, &
" n'ont laiſſé chacun que la couleur, & la ſaveur qui leur
" ſont particulieres; mais nous avons obſervé que le
" quinquina-piton decompoſoit promptement a froid le vin
" rouge: ceque ne fait que tres lentement le quinquina
" du Perou." M. Mallet.

Exp. 17. To two ounces of the decoction, were added of ſpt. vitriol. ten. gtt. xx. The colour of the liquor was immediately changed to a light brown, and a copious precipitation was produced, which in a ſhort time hardened into pieces of reſin, which were not again ſoluble in the ſame mixture, even by ſhaking the phial.

Experiments on the Spirituous Tincture of the Caribbæan Bark.

Exp. 18. To half an ounce of the tincture, prepared as in Exp. 3. were added gtt. v. of the tinct. martial. The black colour produced, was intenſe, and the precipitation copious.

Exp. 19. To half an ounce of the tincture, were added ſpt. vitriol. ten. gtt. v. The whole became turbid, and the acid taſte was ſcarcely perceptible.

Miscellaneous Experiments.

Exp. 20. Half a pound of the cinchona Sanctæ Luciæ, boiled in four gallons of water, filtered and evaporated to pilular conſiſtence, yielded four ounces of extract.

Exp. 21. One dram of lean raw beef, was ſuſpended in two ounces of the infuſion, as prepared in Exp. 1. being placed in a window, expoſed to a ſouth-weſt aſpect, in fifty hours it began to emit bubbles of air, and manifeſt ſigns of putreſcency, running through the different ſtages of putrefaction in about ſix hours later than the ſame experiment with red bark.

Exp. 22. Half an ounce of the Cinchona Sanctæ Luciæ in powder, was infuſed in four ounces of red port wine; in four days the liquor had acquired a ſtrong bitter taſte, was of a beautiful dark reddiſh brown colour, and manifeſted great ſigns of aſtringency on the addition of chalybeates.

Exp. 23. Half an ounce of the Cinchona Sanctæ Luciæ in powder, was infuſed in four ounces of white port wine. In four days the colour was dark brown, but the taſte vaſtly inferior to the former infuſion.

Exp. 24. One dram of the Cinchona Sanctæ Luciæ in powder, was infuſed in two ounces of rectified ſpirit of wine. In five days the tincture had acquired a dark brown colour, manifeſted ſigns of great aſtringency on the addition of chalybeates, had a pleaſant agreeable taſte, mixed uniformly with water, forming on opake, light-coloured mixture, which let fall a very ſlight precipitate.

C H A P. III.

Concluſions from the Experiments on the Cinchona Sanctæ Luciæ.

WE have hitherto been examining the union of two powerful principles, and inveſtigation here points out to us a combination of active parts, greatly ſuperior to what we have before diſcovered.

The general concluſions which we have deduced from our experiments in the preceding ſections, are equally applicable to the preſent ſpecies of cinchona, which we have demonſtrated to be

1. A moſt powerful aſtringent.
2. An exceſſive bitter.
3. An antiſeptic.

On compariſon, we find its aſtringency and bitterneſs greatly ſuperior to the other ſpecies of the bark; and as theſe are the only active principles that we have been able to detect in the cinchona, we may conclude this ſpecies to be poſſeſſed of the virtues of the other in a concentered form. Medical experience confirms this opinion, and we find it producing all the good effects of the bark in a ſmall doſe; but at preſent we ſpeak not of its exhibition in diſeaſe. M. Mallet, to whoſe paper we are under many obligations, has favoured us with ſome concluſions from his own experiments on this ſubject, with which we ſhall beg leave to preſent the reader. The ſubſtance of them is as follows*.

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* For the amuſement of the French reader, we ſhall ſubjoin M. Mallet's own words.—“ Voïci, ce que nous “ pouvons conclure de cette analyſe.

“ 1. L'eau ſuffit pour extraire les principes des deux “ e'ſpéces de quinquina, mais a froid, ou aideè de differens “ degres de chaleur, ſon action, & même celle du vin eſt “ plus prompte, & plus marqueè ſur le quinquina-piton “ que ſur l'autre. Il y' à cependant, dans le quinquina du “ Perou, un principe que l'eau ne peut diſſondre, qui “ trouble l'infuſion, & la decoction ou il paroit errant, & “ qui fait une eſpéce de lait virginal, griſatre de la teinture “ ſpiritueuſe etendue dans l'eau, mais quel eſt ce principe? le trouble de l'infuſion plus marquè dans la decoction de ce même quinquina du Perou, la difficultè “ que ces liqueurs eprouvent a traverſer les filtres, la “ limpiditè qui leur eſt procureè par l'addition de l'alkali “ fixe, ou de l'eſprit de vin, cette même limpiditè qui eſt “ conſtante dans la teinture ſpiritueuſe ou alkaline, tout “ prouve qu'il eſt de nature reſineuſe. Dans le quin-

1. Water is ſufficient to extract the active principles of both ſpecies of bark, but whether cold, or aided by different degrees of heat, its action, and even that of wine, is

"quina-piton, au contraire, tout eſt ſoluble dans l'eau; "l'eſprit de vin y trouve un principe qu'il ne peut diſ- "ſondre, il le depoſe au bout de deux jours: c'eſt ce qui "eſt cauſe que ſa teinture ſpiritueuſe ſe trouble alors: "mais ce principe ſurabonde en petite quantitè, & paroit "etre de nature gommeuſe.

"2. Il exiſte evidemment, dans l'un & dans l'autre, "un principe aſtringent, qui n'eſt nullement dû a l'epi- "derme † mais qui appartient en entier a l'ecorce propre- "ment dite, ou il reſide.

"3. Les deux quinquina ont une odeur de moiſi, qui "n'eſt pas deſagreáble, qui leur eſt propre. Mais ce n'eſt "pas un principe aromatique: on n'y trouve de principe "ni ſalin, ni ferrugineux: ce qui le conſtitue eſſentiel- "lement eſt un extrait ſavonneux, aſtringent, amer, pres "de moitiè plus abondant dans le quinquina-piton que "dans le quinquina du Perou. Ces deux eſpeces ſont "donc de même nature mais avec cette difference, que "la reſine eſt ſurajouteè a la partie ſavonneuſe dans le "quinquina du Perou: & que dans le quinquina-piton "au contraire s'il y'exiſte un peu de gomme à nud les "principes d'ailleurs y'ſont dans un etat de combinaiſon "plus exact, & y' forment un corps ſavonneux plus abon- "dant, & plus parfait." Vid. Journal de Phyſique, ut ſupra.

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† La decoction de l'epiderme du quinquina du Perou ne fait p de l'encre avec les eaux de Paſſy.

quicken

quicker, and more effectual on the quinquina-piton, than on the other. There is nevertheleſs, in the Peruvian bark, a principle which does not diſſolve in water, which diſturbs the tranſparency of the infuſion and decoction, where it appears in too great plenty, and makes a kind of milk (lait virginal) of a greyiſh colour, when the ſpirituous tincture is mixed with water. But what is this principle? The muddineſs of the infuſion, and the greater want of tranſparency in the decoction of the Peruvian bark itſelf, the difficulty which theſe liquors have in paſſing through the filtre, the tranſparency which is occaſioned in them by the addition of fixed alkali or ſpirits of wine, and this tranſparency itſelf, which is conſtant in the ſpirituous or alkaline tincture, all prove that it is of a reſinous nature.

In the quinquina-piton, on the contrary, all is ſoluble in water: there is in it a principle which ſpirit of wine cannot diſſolve, but which it depoſits in about two days: this is the reaſon why the ſpirituous tincture lets fall a precipitate. But this principle ſuperabounds in a ſmall quantity, and appears to be of a gummy nature.

2. There

2. There exiſts evidently in both ſpecies, an aſtringent principle, which does not belong to the outer rind, but is lodged in what may properly be called the whole ſubſtance of the bark.

3. The two ſpecies of quinquina have a mouldy ſmell, which is not diſagreeable, and which is peculiar to them, but it is not an aromatic principle: we could not diſcover a ſaline or ferruginous principle: the conſtituent eſſential principle is a ſaponaceous extract, aſtringent, bitter, and more abundant very near by one half in the quinquina-piton, than in the Peruvian bark.

Theſe two ſpecies are then of the ſame nature, but with this difference, that the reſin is over-added to the ſaponaceous part in the Peruvian bark; and that in the quinquina-piton, on the contrary, there exiſts a ſmall portion of gum, ſeparate from the other principles, which are there in a ſtate of more exact combination, and form in it a ſaponaceous body, more abundant and more perfect.

Such are the concluſions which M. Mallet has deduced from his experiments, to which we are inclined to give all due praiſe, but cannot entirely agree with the learned profeſſor. He ſeems to ſuppoſe the gum a principle diſtinct from the ſaponaceous part: we believe the latter, or what he calls the ſaponaceous part, to be nothing more than the aſtringent gum, which aſſiſts the ſolution of the reſin in water, in the ſame manner as gum arabic does when added to the decoction. Our experiments lead us to agree with him when he aſſerts, that there exiſts more gum in the Cinchona Sanctæ Luciæ than in the common bark; but we have no reaſon to conclude, that it exiſts ſeparately from the reſin; on the contrary, it appears to be thoroughly conjoined with it, from the great bitterneſs of the infuſion.

In regard to M. Mallet's opinion reſpecting the aromatic principle, we perfectly aſſent to it, and believe that no ſuch part exiſts; as we were never able to detect any thing of the kind by diſtillation, or other chemical proceſs.

The medical powers of the bark ſeem to reſide in the gum and reſin; nor will it appear at all ſurpriſing, that ſuch powerful effects reſult from this combination. The chemical analyſis of opium diſcovers no aromatic oil, yet we find it the moſt effectual ſtimulant in nature.

Independent of the analogy drawn from the chemical qualities of theſe two potent remedies, ſuch as each containing an aſtringent gum and bitter reſin, we ſhall find their medical effects in many reſpects alike. Much has been written concerning the ſedative effects of opium, but late experiments* prove it beyond a doubt ſtimulant; and thoſe who underſtand the doctrine of direct and indirect debility, will have no difficulty in explaining, on the moſt philoſophical principles, its action in producing ſleep. Large doſes of bark frequently produce drowſineſs, and in ſome inſtances ſleep, as we have often had opportunities of obſerving; but we cannot at preſent enter into this enquiry: as an antiſeptic, this bark is ſuperior to the red, but inferior to the common.

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* Vid. Harriſon's Theſ. Inaug. de Opio.

C H A P. IV.

On the Medical Effects of the Cinchona Sanctæ Luciæ, or Caribbæan Bark.

HAVING, from experiment, acquired ſome knowledge of the conſtituent parts of this new ſpecies of bark, we ſhall proceed to treat of its effects in medicine. Our analyſis confirms the opinion which we endeavoured to eſtabliſh; and we have no doubt but the bark of St. Lucia is the ſame as that deſcribed by the French writers. The accounts from Martinique, and Guadeloupe, with the labours of M. Mallet, corroborate this idea.

We have found this bark more abundant than either of the former ſpecies in aſtringent gum and bitter reſin; and from this knowledge, we ſhall not be ſurpriſed to find it a very active remedy, in all thoſe diſeaſes which require the uſe of the cinchona. On this ſubject we ſhall not content ourſelves with a mere detail of our own experience. M. Mallet informs us, that he tried it in eleven caſes, ten of which were tertian fevers, which had continued for a longer or ſhorter time; one was of a month, others of two, three, four, or even twelve months ſtanding; all had been treated in the ordinary method, and reſiſted the uſe of common Peruvian bark. The eleventh caſe was a quartan of eight months continuance, in which the common bark had likewiſe been tried without effect.

In the firſt three, he preſcribed a decoction prepared from two drams of the quinquina-piton, to an Engliſh pint of water*, of which the patient took three cupfuls † every hour, which vomited, and purged them all two or three times; but the next day the paroxyſms were very ſhort and ſlight, without any cold fit. In theſe three caſes, M. Mallet could not perſuade the patients to repeat the doſe, they had conceived ſuch an averſion to the exceſſive bitterneſs. He then gave the ſame bark, to the quantity of a dram in powder, mixed with the ſyrup of marſhmallows, but it produced vomitings and purgings. The next day, however, the paroxyſms were ſcarcely perceptible, but the ſick refuſed to continue the medicine. M. Solier tried this remedy conjointly with M. Mallet, in four other caſes; the bolus was uſed, it prevented the return of a quartan for eight days, but the patient, in this inſtance, alſo refuſed the medicine. In the month of November, 1779, M. Mallet again tried the quinquina-piton, in the quantity of a dram, in the form of bolus, to a young man about eighteen or twenty years of age, who had laboured for a month under a tertian fever, which had reſiſted the ordinary treatment. On the very firſt doſe the fever ceaſed entirely, he had no cold fit, and only a ſlight acceſſion, which terminated in a ſweat. He took the ſame bolus two days afterwards, and had not the ſlighteſt return of the complaint. The medicine was omitted, and the patient continued well. M. Mallet adviſed eight grains of the powder to be taken every day, for a ſhort time. This ſmall doſe kept the patient ſufficiently open, and he continued well. On the firſt of December, the ſame induſtrious profeſſor, gave the quinquina-piton in the quantity of half a dram, in the form of a bolus, to two other perſons affected with tertians, which had reſiſted the common practice; one for the ſpace of two,

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* Deux gros de quinquina-piton en decoction dans une chopine d'eau.

† Je leur fis prendre en trois verres.

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the other four months. This doſe produced vomitings and purgings. On the firſt doſe, the cold fit diſappeared, as in other inſtances: the patients took two doſes ſucceſſively, with the ſame effect as the firſt. One of the perſons was perfectly well the next day: the other had only a very ſlight *reſſentiment* next day. Each of the patients took the remedy in the quantity of eight grains for ſome days, and were perfectly cured.

This is the ſubſtance of M. Mallet's experience on the quinquina-piton, from which, we may readily infer the great importance of this remedy. Its activity is manifeſted by its effects in ſmall doſes; but as M. Mallet has given us ſome concluſions on this ſubject, we ſhall lay the ſubſtance of them before the reader, and then proceed to relate our own experience on this article. The reſult of our experiment is, ſays he,

1. That the quinquina-piton, taken in decoction, prepared by two drams to an Engliſh pint of water, and in the doſe of one dram, or even half a dram in the form of bolus, is emetic and cathartic.

2. That it cures recent intermittents; that it ſuſpends thoſe which are old, and have, for

a long time, reſiſted the action of common Peruvian bark; and we have reaſon to ſuppoſe that it would radically have cured them, if it had been poſſible for me to have given other two doſes to the ſick whom I treated, and who would not continue its uſe.

3. That its action is very quick.

4. Laſtly, That the property which it poſſeſſes of vomiting and purging, is an advantage which ought to give it the preference to the common bark, in the treatment of intermittent fevers, ſince it unites the faculty of evacuating the ſick, and producing a cure of the fever. By theſe two properties united, the great inconveniencies of the bark are guarded againſt. Obſtructions, dropſies, cachexy, ſays M. Mallet, and a variety of other diſeaſes, which are too often the ſad conſequences of the bark improperly adminiſtered, are prevented. If we likewiſe conſider the quinquina-piton in a political view, we believe that, independently of thoſe advantages which we have mentioned, it deſerves the attention of government, and that it may become a new branch of commerce to France of great importance *.

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* Vid. Journal de Phyſique, Mars, 1782.

Such is the reſult of M. Mallet's experience; thoſe who favour the doctrine of obſtruction will agree with him, and be diſpoſed to attribute much to the evacuating effects of this remedy; but when we attend to the particulars of his communication, we ſhall be diſpoſed to think, that ſmaller doſes of the medicine would have produced the ſame cures with leſs inconvenience to the patients. Emetics are often effectual remedies; and it undoubtedly is a great advantage of this bark, that it poſſeſſes a laxative quality; but it is only in particular caſes, that we would wiſh it to vomit or purge. Several of my friends have been diſappointed in their expectations, by giving their patients too large a doſe of the Cinchona Sanctæ Luciæ, which produced the effects deſcribed by M. Mallet. In ſome of the London hoſpitals, this ſpecies of bark was found to cure ſeveral intermittents and obſtinate complaints, in doſes of a ſcruple; but as that doſe often proved emetic, the medicine was often laid aſide too ſoon.

I have had an opportunity of making ſeveral fair trials with it, and was at firſt, like other practitioners, under ſome embarraſſments, occaſioned by its proving emetic, in ſmaller doſes than I expected; but I now find the doſes of five, eight, or ten grains, repeated at ſhort intervals, produce all the good effects of the largeſt doſe of common or red bark.

A few grains of canella alba, or ſpecies aromatica, make it ſit eaſy on the ſtomach, in the form of powder or bolus; and the proportion of one dram, or in ſome caſes, half that quantity, infuſed twelve hours in one pint of water, is ſufficiently ſtrong; and a draught compoſed of one ounce of this cold infuſion, with two drams of the ſpirituous tincture, and a few drops of the tinct. thebaic. produces the beſt effects. In three quartans, which had withſtood the uſes of the common and red bark for near three months, eight grains of this medicine, conjoined with five grains of canella-alba, taken three times a day, beginning immediately after a fit, and repeating the doſe every two hours, on the morning of the day on which the paroxyſm was expected, entirely prevented the fit. The patients were ordered to continue the medicine for ſeveral days.

In two of the caſes, where theſe directions were obſerved, the diſorder did not return;

but in the third, the bark being omitted the day before the uſual fit, the patient had a ſlight return of fever, which was removed effectually by repeating the medicine.

In four caſes of tertians, which had continued for ſeveral weeks, and two of which had reſiſted bark, bitters, and alum, in large doſes, the Cinchona Sanctæ Luciæ produced ſpeedy cures: but the moſt ſurpriſing inſtance that I have met with of its good effects, was a caſe of dyſpepſia, or diſorder in the ſtomach.

The ſymptoms of the diſeaſe were complicated: the patient had no deſire for food, his countenance was yellow, he had a fixed pain in the right hypochondrium, was troubled with flatulency, and tormented with ſpaſmodic pains in his ſtomach and bowels; his legs ſwelled conſiderably in an evening, and he ſometimes awoke ſuddenly in the night-time, with a difficulty in breathing, and great oppreſſion about the præcordia. He had an habitual obſtipatio, and was ſuppoſed to labour under a diſeaſed liver. He had taken ſeveral medicines without effect, and was thought incurable. He was ordered a ſlight infuſion of this bark, of which he took one ounce, with two drams of the ſpirituous tincture, twice a day; his appetite began to grow better, and it was propoſed to increaſe the ſtrength of the infuſion. The proportion of the bark was two drams to eight ounces of water; at firſt this increaſe produced nauſea, and a ſlight degree of purging, but on the addition of ſeven drops of the tinct. thebaic. the medicine ſat eaſy on the ſtomach; and in the courſe of ten days, the ſwellings in the legs entirely diſappeared, the patient recovered his appetite and ſtrength, to the great ſurpriſe of his friends; and by the aſſiſtance of gentle exerciſe and proper diet, was ſo well recovered in three weeks, as to be able to undertake a journey to a conſiderable diſtance. The yellowneſs of his countenance was not entirely removed, but the pain in his ſide conſiderably abated under the uſe of the Cinchona Sanctæ Luciæ, which kept his body gently open, and I am informed that he has omitted his medicines, and continues pretty well.

Since the former part of this work went to the preſs, the apothecaries in this place have provided themſelves with the Cinchona Sanctæ Luciæ, and I have had an opportunity of trying it in the autumnal diſeaſes of this

ſeaſon.

ſeaſon. The medicine has anſwered my moſt ſanguine expectation; and I ſhall conclude theſe remarks with a few caſes which happened under my care, and are well known to the medical practitioners of this neighbourhood.

H. C. a labourer in an adjoining village, was ſeized with a cold fit and ſhivering, ſucceeded by heat, and attended with a violent pain in the head, accompanied with ſickneſs, oppreſſion about the præcordia, vomiting and purging. On the third day he took an emetic, which operated well, but his complaints were not relieved. On the eighth day I was deſired to viſit him. His pulſe was then one hundred and twenty in the minute, the pain of his head violent, and the purging not abated; his ſtools were copious, and tinged with blood; his breathing difficult, his body covered over with a clammy ſweat, and he complained of extreme weakneſs, exceſſive thirſt, and want of ſleep.

His wife was in the ſame bed with him, confined by nearly a ſimilar complaint, unattended with purging. They were ordered each tinct. theb. gtt. xxx. at bed-time, and th the next day put upon the uſe of the following mixture:

℞. Cinchonæ Sanctæ Luciæ ʒij.

Canell. alb.

Cort. aurant. hiſp. āā. ʒi. affunde aquæ bullientis ℥xij. macera per horas ſex dein colaturæ.

Adde

Conf. cardiac. ʒij.

Tinct. Cinchon. Sanctæ Luciæ ℥ij. m. ſumantur cochl. ij. amp. 3$^{\text{tia.}}$ vel 4$^{\text{ta.}}$ quâque horâ.

This mixture agreed very well with their ſtomachs; the pain of the head abated, and they were able to take food. The anodyne was repeated; they had each a good night; the man's purging ceaſed; his pulſe, on the ſecond morning after taking the mixture, was ſunk to ninety-four, and he found himſelf ſo well as to be able to get out of bed.

The woman complained of nothing but weakneſs; was enabled to eat a bit of chicken for dinner; and having no more return of her complaints, recovered in a few days. Her huſband had a ſlight return of the fever for ſome evenings, but by the uſe of the mixture, is now pretty well recovered.

A. B. a labourer in the ſame pariſh, had been for ſome weeks afflicted with an obſtinate diarrhœa, which commenced with a febrile paroxyſm. He loſt his appetite and his ſtrength, complained of pain in his ſtomach and bowels, and was conſiderably emaciated: in this ſtate I ordered him the uſe of the mixture above preſcribed, with the infuſion of the Cinchona Sanctæ Luciæ. It had the deſired effect, and in eight or ten days the patient was ſo well recovered, as to be able to go about his uſual occupations.

E. M. was ſeized with a cold fit and ſhivering, ſucceeded by heat, and attended with ſickneſs, vomitings and purgings. She complained of a violent pain in her head and back, had great depreſſion of ſpirits, loſs of appetite, and proſtration of ſtrength. On the ninth day of her complaint, I was deſired to viſit her. She had been delirious a few hours before I ſaw her, but gave rational anſwers to my queſtions, and complained chiefly of pain in the head. Her pulſe was one hundred and twenty, belly regular, and vomitings abated. She had got little ſleep ſince the commencement of her diſorder, and had a conſiderable degree of thirſt upon her.

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I ordered tinct. theb. gtt. xxx. at bed-time: ſhe got ſome ſleep during the night, and in the morning her pulſe had ſunk to ninety-eight; the pain in the head was abated, and ſhe was able to take broths and cordials the next day. The following powder was then preſcribed:

℞. Cinchonæ Sanctæ Luciæ.

Canell. alb. $\overline{\text{aa}}$. gr. vij. ft. pulvis $4^{\text{ta.}}$ quâque horâ ex cyatho theæ meliſſæ ſumendus.

This medicine agreed very well with her ſtomach: ſhe found her appetite grow better, and was apparently in a fair way of recovery, when ſhe was unfortunately ſeized with a miſcarriage, being in the third month of her pregnancy: this accident had threatened a few days before, but the ſymptoms had diſappeared. On this occurrence ſhe began to be alarmed; the diſcharge of blood was very violent, and her attendants began to apprehend immediate danger. Her body was covered over with a cold, clammy ſweat, her heart palpitated, and ſhe fancied herſelf in the agonies of death. I preſcribed tinct. theb. gtt. xxx. to be taken immediately, and recommended the free uſe of port wine and other cordials. She followed this plan, and in a few hours found herſelf eaſier, the palpitation of the heart abated, and ſhe took ſome broths. At night ſhe repeated the anodyne, and in the morning awoke conſiderably refreſhed. The diſcharge of blood continued, and ſhe had very little deſire for food. She was then ordered the mixture with the infuſion, and tinct. Cinch. Sanct. Luciæ, as preſcribed above, which is the general form I uſe for paupers: under the uſe of this, and ſuitable diet, ſhe gradually gathered ſtrength; and in eight or ten days was ſo far recovered, as to be enabled to walk out of doors. The diſcharge entirely abated, and ſhe is now in pretty good health.

S. S. a young woman, aged twenty-two, lately put herſelf under my care for the cure of a quartan, under which ſhe had laboured fifteen months, except three weeks in the month of June laſt, when it appeared to have left her; but ſince that period, it had continued conſtant in its return. She came to me on the morning of the day on which ſhe expected the fit, which generally commenced about two o'clock in the afternoon. No thinking it probable that the return of th

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fit could be prevented that day by the uſe of the cinchona, I ordered her a draught with tinct. theb. gtt. xxx. to be taken an hour before the uſual return of the paroxyſm; but it did not appear to have had any effect, the fit recurred as uſual. The next day ſhe was put upon the uſe of the following powder.

℞. Cinchonæ Sanctæ Luciæ.

Canellæ albæ a͞a. gr. viij. m. ft. pulvis, tertiâ vel quartâ quâque horâ ex cyatho infuſi chamæmeli uſque ad ſolitum paroxyſmi reditum, ſumendus.

The firſt two or three doſes agreed very well, but two taken in the morning faſting were rejected by vomiting. The camomile tea being omitted, and the powders taken in a ſpoonful of water, were retained. She had but a ſlight return of the next fit, and by the uſe of the following powder twice a day for ten or twelve days, got perfectly well.

℞. Cinchonæ Sanctæ Luciæ gr. v.

Spec. aromatic. gr. viij. m. ft. pulvis bis die ex cyatho aquæ ſumendus.

This patient had taken large quantities of the bark, with a variety of other medicines, without any effect.

Mr.

Mr. W. was ſeized with pains in his head, back and loins, oppreſſion about the præcordia, ſickneſs and loſs of appetite. His tongue was parched and dry; he had conſiderable thirſt; his pulſe was one hundred and ten; belly regular. In this ſtate he continued for ſeven days: on the morning of the eighth, I was deſired to viſit him. He had had a very bad night, was uneaſy, and laboured under ſome degree of dyſpnæa. I ordered him a draught, with an infuſion of the Cinchona Sanctæ Luciæ, and ſpirituous tincture, twice a day, with an anodyne at night. The medicines had the deſired effect; his appetite began to recover; his pulſe ſunk to its natural ſtandard, and he had no more return of fever. The anodyne was continued for a few nights; and on the fifth day after the uſe of theſe medicines, he was ſo well recovered as to think farther medical aſſiſtance unneceſſary.

Theſe are the only caſes which I ſhall at preſent lay before the reader; and as I have never met with an inſtance in which the Cinchona Sanctæ Luciæ failed, when properly adminiſtered, I muſt certainly entertain the moſt favourable opinion of its efficacy in ſmall doſes. The addition of aromatic ſpecies,

cies, or canella alba, generally makes it ſit eaſy on the ſtomach, and renders it a pleaſant, as well as an effectual medicine.

Only a ſmall quantity of this bark has been imported into Scotland; but from ſome trials made with it at Edinburgh, great expectations are formed from its general introduction into practice. Dr. Morgan, phyſician at Philadelphia in North-America, has lately read a paper on the virtues of this bark to the *American Philoſophical Society, held at Philadelphia, for promoting uſeful Knowledge*; from which it appears, that it had proved very effectual in the diſeaſes of that climate. The medical practitioners in Barbadoes, Antigua, Grenada, and Tobago, likewiſe ſpeak in high terms of its ſucceſs in many obſtinate diſeaſes, where other barks had failed. I ſhall not therefore protract my account by any farther detail of obſervations upon this article, but ſhall be happy to find that the opinion I have formed, is confirmed by the ſucceſsful practice of the medical practitioners in this iſland.

SECTION IV.

GENERAL OBSERVATIONS ON THE BARK.

HAVING related our experiments and obſervations on the different ſpecies of bark with which we are at preſent acquainted, we ſhall now proceed to make ſome general remarks on the uſe of this remedy.

Ever ſince the introduction of the bark, practitioners have turned their attention to the various modes of preparation; they have puzzled themſelves reſpecting its action, and they have ſeverally diſagreed in their accounts of its exhibition in diſeaſe. To make ſome curſory obſervations on theſe important points, is the intention of this ſection.

CHAP. I.

On the Preparations of Bark.

THE experiments which we have made on the different ſpecies of cinchona, will enable us to reaſon with ſome degree of certainty on this important part of our ſubject.

Acids, alkalies and neutral ſalts, have all been mixed with bark; and the ſubſtance of this vegetable has undergone many a tedious proceſs of maceration, decoction, infuſion, &c. &c. with theſe active ſubſtances, with a view of receiving activity and ſtrength from ſuch conjunction: but from our experiments it will appear, that theſe ſalts are always improperly added to the preparations of bark. We ſhall therefore now enquire into the officinal preparations, which are "an extract (L.E.) reſin (E.) ſpirituous tincture (L.E.) tincture in volatile ſpirit (L.) and compound tincture (E.) It is alſo an ingredient in the ſtomachic tincture (E.)" Lewis's Diſp. p. 197.

The ſoft and hard extracts are prepared with water, boiled with the ſame bark till the liquor remains tranſparent when cold, and only differ in point of conſiſtency. The Edinburgh college directs the extract to be prepared by firſt digeſting the bark, in rectified ſpirits of wine, for four days, then boiling the reſiduum in water, and evaporating it to the conſiſtence of honey; after which, the ſpirit being drawn off from the tincture to the ſame conſiſtence, the two extracts are carefully mixed together, and evaporated to a proper conſiſtence; ſo that we have in this preparation all the virtues of the Peruvian bark that can be extracted by water or ſpirit. Dr. Lewis ſeems to have been well acquainted with this fact, though he miſtook the nature of the principles of the bark. "In the bark," ſays he, "we may diſtinguiſh two kinds of "taſtes, an *aſtringent* and a *bitter* one; the "*former* of which ſeems to reſide in the "*reſinous matter*, and the latter chiefly in the "*gummy*. The watery extract is moderately "ſtrong in point of bitterneſs, but of the "aſtringency it has only a ſmall degree. "The pure reſin, on the other hand, is "ſtrong in aſtringency, and weak in bitter-"neſs. Both qualities are united in the "preſent (Edin.) extract, which appears to "be the beſt preparation of this kind that "can be obtained from this valuable drug." Lewis's Diſp. p. 413.

We entirely agree with the author in his ſentiments of the Edinburgh extract, but have already pointed out his miſtake of the nature of the bark; which is indeed ſurpriſing, conſidering the general accuracy of his obſervations.

Tinctures of the bark have been long in uſe. The London Pharmacopeia orders four ounces of the bark to two pints of proof ſpirit. The Edinburgh Diſpenſatory orders the ſame quantity of bark to two pints and an half of ſpirit. Theſe are undoubtedly excellent preparations; and if the red bark be uſed, the latter quantity of ſpirit will be preferable. Some have thought to aſſiſt the action of the ſpirit by the addition of a little fixed alkaline ſalt, whilſt others have added vitriolic acid; but we have already decried theſe notions. In the London Diſpenſatory we have a tinctura corticis Peruviani volatilis, which is prepared by infuſing four ounces of the bark with two pints of ſpirit of ſal ammoniac. " This tincture," ſays Lewis, " is " but lightly impregnated with the virtues " of the bark; and is ſo acrimonious, that " the largeſt doſe which can with ſafety be " given of it, can contain only a very ſmall " quantity of the ſubject. The medicine, " nevertheleſs," adds he, " has its uſes, and " may be ſerviceable in ſome caſes where " the ſtronger are improper, as in difficulty " of breathing, obſtructions, and oppreſſions " of the breaſt. Stronger tinctures of this

“ kind may be obtained by means of dulci-
“ fied ſpirit of ſal ammoniac, or the ſpirit
“ prepared with quick-lime. All the three
“ may be employed where a large quantity
“ of bark is not required, as at the cloſe of
“ the cure of intermittents, in weakneſs of
“ digeſtion, attended with a cold ſenſation
“ at the ſtomach, and ſome fluxes, particu-
“ larly thoſe from the uterus, where the
“ circulation is languid, the fibres relaxed,
“ and where there is a periodical return of
“ ſlight feveriſh complaints. In theſe caſes,
“ I have often experienced ſalutary effects
“ from a tincture in dulcified ſpirit of ſal
“ ammoniac, given to the quantity of a tea-
“ ſpoonful five or ſix times a day, in any
“ appropriated vehicles.” Lewis's Diſp. p. 309.

Notwithſtanding the eulogy that the Doctor has paſſed upon this preparation, we cannot overlook the firſt part of his account, but muſt believe with him that it is indeed a weak preparation of the bark.

The nature of the menſtruum ſhould correſpond to the intention of the medicine. If we wiſh to exhibit the bark as an aſtringent, the cold infuſion is preferable to any other preparation. The decoction is often a better ſtomachic medicine than the infuſion; and the tincture in ſpirit is generally an excellent addition to either, as it unites powerfully both the active principles of the bark. Wine is very much inferior to ſpirit, but when devoid of acid, may be uſed with advantage. In the tinctura corticis Peruviani compoſita (Edin.) the addition of ſnakeroot and gentian was certainly of ſervice, though the college has omitted theſe ingredients and the tincture, in their laſt edition of the Diſpenſatory. Huxham's tincture of the bark appears to be a good preparation, and we have often found the addition of canella alba of great ſervice to the tincture, infuſion, decoction, or powder of bark.

The extract of bark has lately fallen into diſrepute: indeed, like ſome other preparations of the bark, it has been much miſunderſtood. Under the ſame word may be included two preparations very different. The watery extract is chiefly compoſed of the aſtringent gum, and the ſpirituous extract of the bitter reſin. This knowledge is of the greateſt utility in practice; for although we may commit the miſtake with impunity in the common preparations of infuſion, decoction, or tincture, yet when we come to exhibit the pure principles of the bark *per ſe*, it is of the utmoſt conſequence to attend to the diſtinction. The gum, which is ſoluble in water, is perhaps one of the firſt aſtringents in the Materia Medica; in practice we ſhould therefore attend to preſcription, and ſpecify the extract which we wiſh to employ. The neglect may be attended with danger to the patient. Let us ſuppoſe, for inſtance, a perſon in the laſt ſtage of a violent diarrhœa, the diſcharge is very profuſe, the patient much reduced, and we wiſh to exhibit the bark; the extract is fixed upon, as moſt likely to ſit upon the ſtomach; the reſinous or ſpirituous extract is given, every ſymptom is aggravated, and the patient purged out of this life, by the ignorance or inattention of his phyſician. Such might be a patient's fate, whilſt the knowledge and juſt exhibition of the aſtringent gum would have ſaved his life. Not, however, to ſpend more time in conjecturing miſtakes which too often occur in real practice, I ſhall conclude theſe remarks with obſerving, that the ſimple powder of bark is often preferable to any preparation.

C H A P. II.

On the Action of the Bark.

AS the Peruvian bark was firſt introduced into practice for the cure of a diſeaſe, the nature of which had been long miſunderſtood, it is no wonder that the theory of its action has been obſcured.

At firſt it was confined to the intermittent, but in courſe of time it was adminiſtered in other diſeaſes apparently of a different tendency; hence, whatever theories had been formed of its modus operandi were now deſerted. The doctrine of Lentor was long an enemy to the bark, even in agues; and in continued fevers it was thought a poiſon. Some bold practitioners, however, ventured to give it early in febrile complaints, that raged with violence in hot climates: the beſt effects enſued from its uſe, but theory long prevented its exhibition in Europe. The prejudice of opinion began at length to be diſpelled, and preparations of the bark gradually crept into uſe in the low nervous fever. In that ſpecies attended with petechiæ, or tendency to putrefaction, it was found particularly ſerviceable; hence ſprang the doctrine of its antiſeptic virtues: it was now eſteemed a powerful corrector of depraved fluids, and in every caſe where the humours were ſuppoſed to be corrupted, it was boldly exhibited, and with the beſt effects. Chemical experiment appeared to give great probability to this theory of its action; but by the ſame inveſtigation we were taught, that the moſt powerful ſtimulants were the beſt antiſumecks. The experiments of Sir John Pringle inform us, that volatile alkali is one of the beſt antiſeptics; a fact which at firſt appeared incredible, as alcaleſcency was generally eſteemed a putrefactive ferment. The doctrine of fever, introduced by Hoffman, and improved upon by Dr. Cullen, ſeemed to open a new view of the operation of remedies. Debility, the ſuppoſed cauſe of ſpaſm, together with that modification of it, termed atony, was to be cured alone by tonics; hence the Peruvian bark was ſaid by Dr. Cullen to act as a tonic. This was undoubtedly a great innovation in practice, and led to an entire new view of diſeaſe. The doctrine of criſis, or critical evacuations, received a ſhock in this explanation; for as Senac obſerves, " Abſque criſi equidem tolli " febres corticis Peruviani opera pleriſque " perſuaſum eſt; nam veluti *uno ictu* eas " aliquando eliminat, nec tamen evacuationes " per alvum, aut per urinæ, ſudoriſque duc- " tus molitur: eas ſaltem ſibi non occurriſſe " multi tradunt*."

Obſervations of this kind give great probability to Dr. Cullen's opinion; and we are inclined to believe, that the bark operates on the ſolids, and produces its effects by its action on the ſtomach, without any reference to its being abſorbed by the lacteals, or carried into the circulating maſs; but it may be worth our while to enquire here into the nature of tonic remedies: in doing this, we muſt beg leave to make uſe of Sir Iſaac Newton's rules of philoſophizing, and

" 1. Admit no more cauſes of things than are ſufficient to explain appearances. And

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* Senac de Recondit. Nat. Febr. cap. vii. l. 2.

2. To the ſame effects we muſt, as far as poſſible, aſſign the ſame cauſes*."

Tonic, in the preſent ſenſe, is nothing more than a remedy that has the power of increaſing the tone, or moving powers of the animal machine. Various kinds of food, and medicines produce the ſame effect. Thus a good dinner, or a glaſs of wine, adds vigour to the ſyſtem, and increaſes the tone or ſtrength of a perſon previouſly debilitated. A glaſs of brandy will have the ſame effect, though leſs permanently. And if a doſe of bark is found to be equally, or in many caſes more effectual, why not conclude that it produces the ſelf-ſame end, in the ſelf-ſame manner? The effect of a glaſs of wine, may be leſs tranſitory than that of a glaſs of brandy, and a doſe of bark more permanent than either; but they differ in degree, not in eſſence. They both act as tonics, and equally deſerve that appellation: but no writer, no practitioner in phyſic, has called a glaſs of brandy a tonic remedy. In the ſame manner, light is one of the moſt powerful tonics of the animal and vegetable kingdoms. Of many vegetables it is a neceſſary *pabulum vitæ*; without it they pine, wither, debilitate and die: yet no one has ſtyled this a tonic power. It is called a ſtimulant, and ſaid to operate by its ſtimulating powers. Are we then to forſake philoſophy? Are we to admit diverſity of effects from the ſame cauſe? or rather, are we to admit one uniform cauſe, producing the ſame effects? The diſtinction into tonics and ſtimulants may be made by thoſe who love diviſion, for the ſake of ſubtility; but true philoſophy deſpiſes what miſleads the mind: and when I ſay a glaſs of wine ſtimulates a man to action, I mean the ſame as if I ſaid it increaſed his tone or power of action at the time. If a known ſtimulus produces the ſame effect as a tonic, I have reaſon to conclude, it does it in the ſame manner. Is not this argument ſupported by juſt reaſoning and true logic? To reaſon otherwiſe, is to reaſon falſely; and to forſake reaſoning in phyſics, is to make medicine raſh empiriciſm. Additional arguments might be brought to ſupport my opinion, and I could add weight to my ſuppoſition from analogy. Wherever the bark is required, direct ſtimulants are found of great ſervice: thus good living, generous diet and exerciſe, are conſtantly preſcribed with the uſe of this remedy: but to point out farther the analogy betwixt the bark and other ſtimulants, will be unneceſſary. From what we have ſaid, it will appear, that the term ſpecific is improperly applied to the action of the Peruvian bark. Its action is the ſame as other remedies that cure diſeaſes of debility, and is not enveloped in any dark myſtery. It is a ſtimulus that very often is well adapted to diſeaſe; but, we believe, many lives have been loſt by its miſtaken uſe. Even the tonic doctrine has been productive of error; and this remedy has been relied on, where more diffuſible ſtimuli were required. But we ſhall not attempt in the preſent page to trace the errors of medicine; to explain our own doctrine will be employment enough, and that we attempt in the following experiments.

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* Vid. Newton's Princip. Book III. p. 1.

Exp. 1. At ſeven o'clock in the morning, when my pulſe was at ſixty-two in a minute, I took half a dram of common Peruvian bark. Continuing to ſit ſtill, and make obſervations on my pulſe, I found that in three minutes after taking the doſe, it beat ſixty-ſix, and I began to feel a conſiderable degree of heat ſuffuſe itſelf over my face, hands, and whole body. In five minutes more, my pulſe roſe to ſixty-nine, and in ten minutes was at ſeventy-ſix, where it continued for near two hours, and then gradually ſunk to ſixty-four.

Exp. 2. At ſeven o'clock in the morning, my pulſe beating ſixty-two in the minute, I repeated the former experiment, with nearly the ſame reſult; but when my pulſe had ſunk to ſixty-eight, I repeated the doſe of bark. In three minutes, my pulſe was ſeventy-two; in five, ſeventy-ſix; and in ten, eighty-four, where it continued near an hour, then gradually ſinking to its uſual ſtandard, ſixty-four or ſixty-ſix.

From theſe experiments I would infer the direct ſtimulating power of the bark: the heat, and quickneſs of the pulſe, ſhew the vigour of the heart to be increaſed; and the length of time which this change continued, manifeſts the permanency of the ſtimulus which produced theſe effects. The nature of this work will not allow us to purſue this enquiry; otherwiſe, analogy and ſucceſsful practice might be brought in ſupport of our doctrine. The drowſineſs and ſleep ſometimes produced by large doſes of bark; the exhibition of opiates in intermittent fevers, as adviſed by Dr. Gregory and Dr. Lind; together with the mode which Dr. Cullen adviſes, of exhibiting the bark at ſhort intervals before the expected return of a paroxyſm, would ſeem to ſtrengthen our ſuppoſition: but the minds of men muſt be diveſted of prejudice, before analogies can be admitted, which militate againſt a favourite hypotheſis. The analogy betwixt wine and opiates is now pretty generally allowed; and we have no doubt but farther analogies will in a ſhort time be univerſally acknowledged; and that the ſpecific quality of the bark will be found to reſide in its permanent ſtimulant action on the nervous ſyſtem.

CHAP III.

General Obſervations on the Uſe of the Bark in Diſeaſe.

FROM the principles which we have attempted to eſtabliſh on the operation of this remedy, pretty clear ideas may be drawn *à priori*, reſpecting the diſeaſes in which it will be of ſervice. It will not be neceſſary to enter minutely into this part of our ſubject; general obſervations will ſuffice, and as we ſpeak chiefly from experience, we ſhall not ſearch for medical authority to ſupport our argument in every inſtance.

The bark is one of the moſt powerful remedies with which the world is bleſſed, but it is nothing more than an auxiliary of health: and without ſtrict attention to other circumſtances, its repeated doſe is of no avail.

Regimen is its grand aſſiſtant, and we may in vain preſcribe our medicine without we injoin its aid. No rule, perhaps, is ſo univerſal as that which we are able to form on this ſubject. It is a general rule, as far as I know, without one exception, that whenever the bark is indicated, generous diet will be found uſeful: but the great point will be, to aſcertain the due bounds of this expreſſion, and regulate the proper uſe of food. The nature of nutriment appears to have been much miſunderſtood. Some philoſophers have contended for a vegetable diet, others an animal, and the wiſer for a mixture of both, as the proper food of man. The ſtructure of our bodies, the formation of our teeth, and a variety of other anatomical arguments ſupport this opinion; but even thoſe who argue thus philoſophically, ſeem to entertain falſe notions on the principle of nutriment. Vegetables have been ſuppoſed to contain a peculiar matter of a ſaccharine nature, which by animal proceſs is converted into gluten, or animal ſubſtance; hence patients of debilitated conſtitutions, and emaciated habits, have been confined to a vegetable diet; and milk*, as containing abundance of this ſaccharine matter, and partaking, but in a ſmall degree, of the animal nature, has been copiouſly adminiſtered: but we have ſeen ſeveral caſes which incline us to believe, that this opinion is not founded in truth. Perſons who live much on animal food, and indulge in the uſe of fermented liquors, are ſeldom afflicted with thoſe diſeaſes which affect people accuſtomed to a more ſpare diet; they are in general much ſtronger, and only liable to accidental illneſſes of an inflammatory kind. This fact tends to confirm the opinion, that animal food is moſt nutritious, and a certain daily portion of it appears neceſſary for the health of the human ſyſtem. When the ſtrength of the body is impaired by aſthenic diſeaſe, it becomes more neceſſary; and in all thoſe caſes which require the uſe of ſtimulating medicines, the work of the phyſician will ſoon be undone by diet of an oppoſite nature. I have ſeen a patient juſt relieved from the moſt excruciating ſtomachic complaints by the uſe of bark, and medicines of a ſimilar nature, thrown into the moſt convulſive agony by imprudently eating a ſlice of apple or other raw vegetables. We cannot therefore too ſtrictly enjoin abſtinence from this improper food, and ſtrenuouſly recommend the uſe of a more generous diet, of that kind of animal food, which the taſte of the patient may render moſt convenient. On ſeveral occaſions, animal broths may be preferable to ſolid meat. The ſtomach is ſometimes unable to digeſt even ſtrong broths. We muſt then conſult the various arts of cookery, and ſometimes are obliged to have recourſe to vegetables, all other diet being, in certain caſes, of great debility, too ſtimulating. Theſe are caſes which require peculiar attention; and we may depend upon it as a certainty, that our patient is in a fair way of recovery when he can bear generous food, which never ſhould be denied under proper reſtrictions. The great art is, not to overload the ſtomach; but ſo many little circumſtances are to be attended to in this reſpect, that we ſhall not weary the patience of our reader by a detail of luxurious or culinary rules.

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* Notwithſtanding what is here ſaid againſt a milk diet, the author confeſſes to have an high opinion of it in certain caſes: but this ſubject he means to purſue more fully, when he has leiſure to compleat his diſſertation, which was honoured with one of the Edinburgh Harveian prizes, April 12, 1783.

The uſe of wine, ſpirits and water, or malt-liquor, may be properly conjoined to that of bark. Care ſhould be taken that each be good of its ſort; a mixture of ſpirits and water generally makes the beſt beverage. If wine does not turn acid, or ſtrong-beer produce flatulency, ſmall quantities may be uſed with the greateſt advantage.

So much for the regulation of diet.

Exerciſe is generally a powerful auxiliary to the bark when it can be conveniently uſed. Its mode may be varied according to the circumſtances or diſpoſition of the patient. Riding on horſeback, in a carriage, walking or ſailing, have their reſpective advocates.

Having premiſed thus much on regimen, we ſhall proceed to ſpeak of ſome diſeaſes in which the bark is given with ſucceſs.

Inflammation is commonly attended with ſo many ſymptoms which forbid the uſe of ſtimulants, that we ſhall appear at firſt ſight, to have ſeized the wrong end of noſology, and treat of a diſeaſe in which our remedy can never be uſeful. Inflammation is of various kinds; increaſed heat in a part, quick ſtrong pulſe, and other ſymptoms of increaſed action in the ſyſtem, require the uſe of antiphlogiſtics; but even this ſpecies of inflammation in its termination, frequently calls for the aid of bark. Gangrene is cured, and ſphacelus prevented by its liberal exhibition. Ill conditioned abſceſſes and foul ulcers often require its uſe; and there is one peculiar form of local inflammation, in which the cortex has lately been given with incredible advantage.

The *ſcrophula* or *king's-evil*, has been called one of the endemial maladies of Britain. Its ſymptoms are various; but the ſubjects of this dire diſeaſe are generally of the moſt puny and debile conſtitutions; inflamed eyes are commonly the firſt, or at leaſt the moſt obſtinate ſymptoms of the complaint; bleeding, purging, and the antiphlogiſtic regimen never fail to increaſe the diſorder, whilſt a contrary method is found of the greateſt ſervice.

The *eryſipelas* generally occurs as an inflammatory diſeaſe; but there is one ſpecies of it, which Dr. Cullen calls the phlyctænodes, that is ſometimes attended with ſymptoms of mortification or gangrene: this moſt commonly happens in warm climates, or in hot ſeaſons. In ſuch caſes the bark is the only remedy.

The *quincy*, or *ſore-throat* appears in various forms, happening to the robuſt and healthy of every age and ſex. Its moſt common cauſe is accidental expoſure to cold, and under ſuch circumſtances it generally terminates favourably in a few days, without the uſe of medicine; but there is one ſpecies denoted the *putrid*, or *malignant* ſore-throat, in which the utmoſt ſkill of the phyſician is required to ſave the life of the patient.

The reigning ſymptoms of this complaint are, ſwelling and diſcoloration of the tonſils, and mucous membrane of the fauces, which is covered with whitiſh, livid, or aſh-coloured ſpots, and ſpreading ulcers of a malignant nature; the patient's breath is extremely fœtid and offenſive, his pulſe is low and weak, and a ſcarlet eruption generally covers the ſurface of the body. Dr. Fothergill has ſhewn the uſe of bark in this complaint. The decoction or infuſion makes a good gargle, but muſt not ſuperſede the internal uſe of this remedy.

The *rheumatiſm* is properly divided into acute and chronic; the former ſpecies moſt commonly occurs after expoſure to cold, and is a pure inflammatory diſeaſe for ſome days, when it degenerates into the latter, which is often one of the moſt afflicting maladies of old age. The external and internal uſe of ſtimulants affords relief; and the bark often performs a cure, when other remedies have failed.

The *ſmall-pox* is commonly uſhered in with every ſymptom of increaſed action, and continues under this form for the firſt eight days; the ſuppuration of the puſtules commences, and a train of different ſymptoms begins to appear. In the diſcreet or regular ſmall-pox the ſecondary fever is generally ſlight, ſometimes not at all obſervable. In the confluent, the diſeaſe runs a different courſe, the puſtules are very numerous, appear flaccid, never aſſume that turgid elevated appearance which diſtinguiſhes the regular. The fever is of the low nervous kind, petechiæ appear in various parts of the body, and every ſymptom of debility prevails. In ſuch inſtances, the bark has been ſtrenuouſly recommended by the late learned Profeſſor Monro, and daily practice evinces the utility of his diſcovery.

Hæmorrhages have, ſince the days of Stahl, commonly been conſidered as phlogiſtic diſeaſes, and in almoſt every inſtance evacuation has been preſcribed; but I have lately known ſeveral inſtances of the good effects of a contrary treatment. A caſe of this kind occurred to my knowledge. A gentleman who had, at the age of ſixty, entered on an abſtemious courſe of life, and low diet, was ſeized with a profuſe bleeding from the noſe; to ſtop which, the practitioner bled him at the arm, the diſorder increaſed, the blood-letting was repeated, and every ſymptom aggravated, till at length the weakneſs of the patient pointed out the error in practice; a contrary method was tried, and the patient recovered under the uſe of bark and wine. I could relate ſeveral inſtances of the bad effects of the antiphlogiſtic treatment of hæmorrhagy, but it would lead me into too wide a field. A due diſcrimination betwixt active and paſſive diſcharges of blood, marks the experienced phyſician.

Hæmoptyſis, or *ſpitting of blood*, has long been conſidered as one of the moſt incurable diſeaſes; and the generality of practitioners will agree with me that they have ſeen few inſtances of genuine idiopathic hæmoptyſis treated in the common method, terminate favourably: a phthiſis is almoſt a certain conſequence. I have lately paid conſiderable attention to this fatal complaint, and have ventured in another work, to differ from the common opinion delivered by authors.

Experience ſeems to have convinced ſome very attentive obſervers upon the Continent, of the impropriety of the common mode of treatment in hæmoptyſis. Speaking on this ſubject, Lieutaud ſays, " venæſectio, ineunte " morbo, in nonnullis proficua cenſetur: alias " inutilem operam navat, vel noxam infert: " hanc præcipue ſolent *imperiti*, in hacce " febris acutæ ſpecie, quæ à tuberculorum " inflammatione, & ſuppuratione ſoboleſcit: " ſed ab hac intempeſtiva ſanguinis miſſione,

" pluries iterata, ad æthereas ſedes properaſſe " ægros pluries vidiſſe memini *.

It may perhaps be objected, that Lieutaud here ſpeaks againſt blood-letting in the more confirmed ſtage of phthiſis, but the learned Ludwigius, has given his opinion in more expreſſive language. " Fateor in his corporis " diſpoſitionibus, ſæpe nullum auxilium " afferendum eſſe. Si enim ex *debilitate nervoſa*, vera vis ſanguificationis & in optima " ſæpe ætatis vigore, deficit, *morbo hæmoptoico*, caſu ſuperveniente, non ſolum poſt " venæſectionem repetitam, tenuis ſanguis " porro effluit, & ſæpe continuatæ eruptionis " per hæmoptoem cauſa eſt, ſed & tum ſanguinis effluxus, ſolo exquiſitiſſimo diætæ " regimine cohibetur; vera circulationis vis, " & boni cruoris, reliquorumque humorum " elaboratio nunquam reſtituitur: languor " corporis ſubinde inducitur, & tabes inevitabilis crebra reddit juvenum funera. Sic " ſæpe in primo morbi hæmoptoici inſultu, " languida corporis diſpoſitione viſa, triſtem " ſæpe prognoſin enuntiat medicus, & ſanos " ſæpe juvenes ad hos morbos diſpoſitos ex-

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* Lieut. de Morb. intern. pect. c. depthin.

" hortatur, ut corporis vigorem univerſum " accurata diætâ ſuſtineant, ne levi ſæpius " hæmoptoes inſultu affecti, ex imbecillitate " pereant *.

From the obſervations of theſe great men, conjoined to our own experience, we will venture to preſcribe the uſe of bark and its auxiliaries, in moſt caſes of this diſeaſe.

The *Menorrhagia* is a diſeaſe peculiar to the female ſex. The increaſed diſcharge, which characteriſes this complaint, occurs moſt commonly to women previouſly expoſed to powerful debilitating cauſes; and in ſome caſes which I have lately attended, the bark produced cures when other remedies had failed. The practice of ſeveral of my medical friends confirms this obſervation.

There is another female complaint, apparently of an oppoſite nature, but often proceeding from the ſame cauſes, in which the bark is of acknowledged uſe. The *Amenorrhæa* occurs to women previouſly debilitated, and can only be effectually cured by the bark, generous diet, and the free uſe of exerciſe.

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* D. Chriſt. Gottlieb. Ludwigii Adverſ. p. 155. Vol. I.

Diarrhœa is often a temporary diſeaſe, and frequently is cured without the aid of medicine; but ſometimes it becomes very violent, ariſes from every ſlight debilitating cauſe applied to the alimentary canal, and in ſuch caſes threatens great danger. The bark, as liable to run off by ſtool, has not been commonly adminiſtered in theſe caſes; but I have ſeen examples of its efficacy, one of which is recorded in the chapter on the medical effects of the Cinchona Sanctæ Luciæ.

In that diſtreſſing congeries of complaints, which Dr. Cullen has ſo elegantly deſcribed under the title of *Dyſpepſia*, or *Affections of the Stomach*, our medicine affords the greateſt relief, and is ſeldom found to fail in performing a ſpeedy cure. Dr. Home informed us, in his clinical lectures in the year 1782, that he had laboured under dyſpeptic complaints for ten years, had taken a variety of medicines without effect; but at length, having recourſe to the bark, was effectually cured. I have been witneſs to ſeveral remarkable examples of its efficacy in public and private practice. The *Gout* frequently makes its appearance under ſuch a form, and produces the moſt dreadful effects in its lingering conſequences; in theſe inſtances the cinchona may generally be employed with great advantage.

Aſthma is a diſeaſe which appears to be juſtly diſtinguiſhed into ſpecies, requiring a different mode of treatment. When it occurs to the ſanguineous or plethoric habit, blood-letting and emetics prove ſerviceable; but the ſpaſmodic aſthma generally occurs to perſons of the moſt debilitated conſtitutions, and is only to be cured by the uſe of bark, opiates, and other ſtimulants.

Fever has been conſidered as a general inflammation: pyrexia or increaſed heat makes a principal part of its character; and in its treatment, every heating thing has been carefully avoided. The want of a due diſcrimination betwixt the low, nervous, and inflammatory fever, has given riſe to the indiſcriminate uſe of the antiphlogiſtic regimen, which has proved the bane of medicine and recovery. Some facts, ſome aſtoniſhing facts, within theſe few years, have led to the free uſe of ſtimulants in typhus, or fevers of the low, nervous type. Dr. Huxham long ago introduced the uſe of bark in fevers attended with petechiæ, and other ſymptoms of putridity;

tridity; and we are happy in one inſtance, of erroneous theory having produced good practice. The doctrine of antiſeptics introduced the uſe of remedies which cured the patient by deceiving the phyſician: the bark, which was ſwallowed to ſweeten corrupted fluids, ſtamped vitality upon the ſolids, and ſtimulants are now acknowledged the beſt antiſumecks. The great fatality of typhus under bad management, and its happy termination under the liberal uſe of bark and other ſtimulants, eſtabliſh beyond a doubt the utility of this remedy in that ſpecies of fever.

The *Ague*, or intermittent fever, has been peculiarly favourable to our remedy. It firſt introduced the cinchona to our acquaintance, and gained it that attention which it ſo highly deſerves. Intermittent fevers are diſtinguiſhed into various ſpecies, and are all characterized by having paroxyſms or acceſſions at ſtated periods, with manifeſt intermiſſions or remiſſions. The period of acceſſion is marked by a ſingular affection of the ſyſtem, called the cold fit; in which the patient complains of a ſenſation of cold, though his ſkin, to the touch of another perſon, or the thermometer, manifeſts in general, increaſed heat: this ſenſation, which is attended with a ſhaking or trembling of the limbs and different parts of the body, and continues for a longer or ſhorter time, according to the nature and violence of the diſeaſe, is ſucceeded by what is called the hot fit; in which the patient complains of heat, head-ach, thirſt, and every ſymptom of increaſed action; for ſome time the ſkin continues parched and dry, but on the coming on of a ſweat, thoſe diſagreeable ſymptoms diſappear, and the patient is reſtored to what may be called, his uſual ſtate of health; this continues till the next return of the paroxyſm, which is commonly a repetition of the circumſtances deſcribed. When the diſtance, or interval from one paroxyſm to another, is forty-eight hours, the diſeaſe is called a *tertian*, and this form is obſerved to come on pretty conſtantly at noon. The *quartan* obſerves an interval of ſeventy-two hours, and has its acceſſions in the afternoon. The *quotidian* has an interval of twenty-four hours betwixt each fit, and its paroxyſms are obſerved to happen in the morning. This is the common diviſion of intermittents into ſpecies, which may generally be pretty well marked; each ſpecies has its varieties, and authors have treated of theſe various forms with great ſubtility.

Dr. Cleghorn, in his Diſeaſes of Minorca, has communicated ſeveral valuable and curious obſervations on this ſubject, which has been refined upon by Dr. Cullen, who maintains that all fevers conſiſt of repeated paroxyſms. The *remittent fever* is, according to him, nothing more than an intermittent, with a ſhort interval, or a continued fever, with exacerbations and remiſſions remarkably manifeſt.

Theſe are the fevers in which practitioners ſeem thoroughly agreed about the uſe of bark, and no theory now dares to exclude the free adminiſtration of this remedy in theſe diſeaſes: accordingly we find all the late authors on fevers, recommending careful and attentive obſervation to theſe circumſtances.

Continued fevers are thoſe which have no intermiſſion, do not ariſe from marſh miaſma, which, according to Dr. Cullen, is always the cauſe of the former, but yet are ſuppoſed to have regular exacerbations or remiſſions twice a day. It would lead us too far aſtray to purſue the ſubject of fever much farther: we ſhall therefore content ourſelves with obſerving, that the *typhus* or *low nervous fever* is that in which the bark will be found moſt efficacious: regardleſs of exacerbation or remiſſion, we muſt exhibit our medicine freely. The hiſtories of diſeaſes in warm climates teach us, that delay is dangerous; without waiting for ſymptoms of putridity, we muſt attack the diſeaſe, even in its greateſt rage of heat, and conquer that deſtructive foe of health, debility.

The *hectic fever* has long withſtood the uſe of medicine, and practitioners have differed widely in their accounts of the efficacy of bark in this diſeaſe; but from ſome late inſtances, we are inclined to believe, that it may be employed with ſucceſs even in the advanced ſtages of a phthiſis, when the exacerbations of this fever are moſt remarkable. In this opinion we are confirmed by the obſervation of the ſagacious De Haen, whoſe words we uſe: “ Mirum profecto fuit intra
“ quam breves dies collapſæ vires reſurge-
“ rent, febris decreſceret, reviviſceret, appe-
“ titus, defœdato vultui color rediret nitorque
“ & nocturnæ anxietates rareſcerent, blandi

" obreperent ſomni, ſputiſque pectus ſe commode evacuaret*."

We ſhall here conclude our remarks on the uſe of the bark. A variety of other diſeaſes, ſuch as palſy, dropſy, hyſteria, &c. might have been mentioned; but from what we have ſaid, it will appear, that this remedy is properly employed in all diſeaſes of direct debility: and we would wiſh it to be underſtood, that what we have advanced reſpecting the cinchona as a genus, may, as far as our own limited experience leads, be extended to that ſpecies which it is the peculiar object of this little work to recommend. Some of my readers may, perhaps, blame me, for having conſumed ſo much time on one article of the materia medica; but I am perſuaded, that I ought to apologize rather for the haſty manner in which theſe thoughts have been ſent into the world, than for the attention beſtowed upon a ſubject of ſuch importance. Inaccuracies may occur, but a candid reader will readily overlook the imperfections in the intention of the author. " Solent autem " homines," ſays the immortal Verulam,

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[*] De Haen de Virtute Sing. quor. Med. cap. xxvii.

"naturam tanquam ex præalta Turri, & à "longe deſpicere, & circa generalia nimium "occupari: quando, ſi deſcendere placuerit, "& ad particularia accedere, reſque ipſas "attentiùs & diligentiùs inſpicere, magis "vera & utilis foret comprehenſio." Bacon, l. ii. cap. 1.

THE END.